OCT. 21 1960

# PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

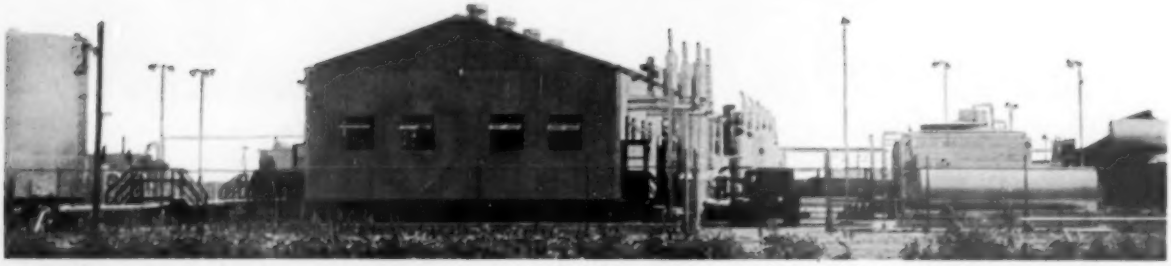
Export nations want managerial control of oil companies ..... 28

UNIV MICROFILMS INC
EDITORIAL DEPT
313 N FIRST ST
ANN ARBOR MICH A C

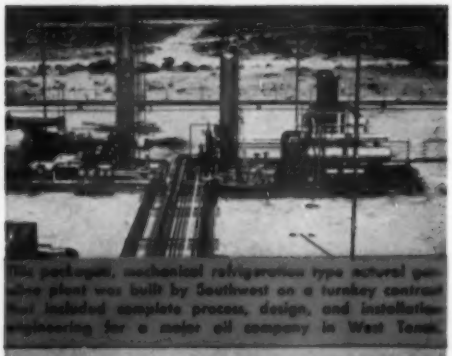
from drawing board to installation . . .

# Southwest

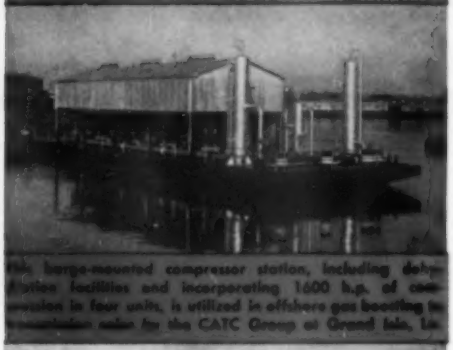
## specializes in TURNKEY operations



Southwest designed, engineered and installed this prefabricated water pumping station for a Pan American Petroleum Corporation unitized water-flooding operation in Southwest Texas.



This package, mechanical refrigeration type natural gasoline plant was built by Southwest on a turnkey contract that included complete process, design, and installation engineering for a major oil company in West Texas.



This barge-mounted compressor station, including dehydration facilities and incorporating 1600 h.p. of compression in four units, is utilized in offshore gas boosting to transmission mains for the CATC Group at Grand Isle, La.

In main line boosting for a major gas transmission company along the Texas Gulf Coast is this compressor station of four 660 h.p. packaged integral compressors, built complete on a turnkey contract.

Southwest incorporates engineered, pre-fabricated methods to install unitized facilities — *quicker and cheaper* — for the oil, gas and chemical industries on a turnkey basis. All are API-ASME code constructed.

Southwest's competent staff of mechanical, chemical and civil engineers—all registered as professional engineers with years of experience in this type work—can complete your project months ahead of field-constructed plants. Complete flexibility also enables Southwest to construct to your engineering requirements or to offer custom-designed plants FOB our shops for installation by others.

For the finest in design and operating efficiency, turn to Southwest for your next turnkey operation.

**SOUTHWEST INDUSTRIES, INC.**
P. O. Box 19188, Houston 24, Texas

**PLANTS:**
Houston, Texas
Calgary, Alberta, Canada
Mexico, D. F., Mexico

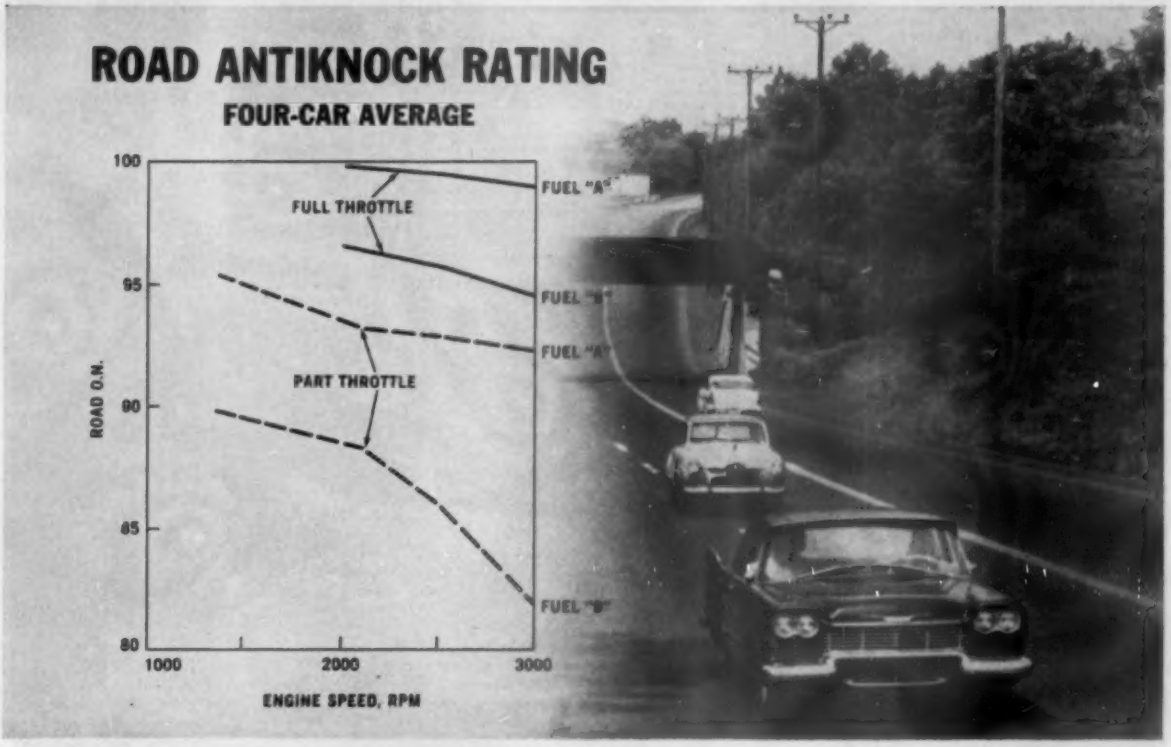
**BRANCH OFFICES:**
Midland, Texas
Tulsa, Oklahoma
New Orleans, Louisiana
Calgary, Alberta, Canada
Mexico, D. F., Mexico

**SALES AGENCIES:**
New York, New York
Detroit, Michigan
Chicago, Illinois
Los Angeles, California
Equipex, S. A., Caracas, Venezuela

**SUBSIDIARY COMPANIES:**
Southwest International Corporation; Southwest Barber Ltd.; Industrias Southwest de Mexico, S. A.; Southwest Engineers, Inc.

**Also designers, manufacturers and constructors of Packaged Compressors, Inert Gas Generators, $CO_2$ and $H_2S$ Removal Units, $H_2S$ Recovery Units and "Tenex" Exhaust Gas Injection Units.**

# There's a Road Bonus from Antiknocks...




Your customers—passenger car owners—are the final judges of your fuel's antiknock quality. They judge performance in their cars on the road.

That's why the road bonus you get from antiknocks —the extra octane, over and above Research and Motor ratings—is so important. The bonus is realized when you design a fuel to meet a given Research octane specification, but with increased antiknock compound concentration. It can make the difference between customer satisfaction and dissatisfaction, and is particularly significant when guarding against high speed or part-throttle knock.

### 3 to 5 RON Higher

Road bonus from antiknocks has been demonstrated by tests performed on two fuels, identical in all respects except TEL content. Fuel "A" contained 3.0 ml TEL/gal. and fuel "B" contained no TEL.

Test results, as shown on the chart above, rated the fuel with TEL three to five Road octane numbers higher than the fuel without TEL. *Other research shows that road bonus continues to go up with the use of a fourth ml TEL/gal.*

### What this Means to You

It is also apparent that the effect of TEL is greater at high speeds, generally the critical point with modern vehicles and sensitive fuels. Part-throttle operation with certain vehicles also is a critical point where TEL bonus is significant.

*More proof that antiknocks are your best octane improvement buy on a ¢/Road octane barrel basis.*

**ETHYL CORPORATION,** NEW YORK 17, N.Y. • TULSA • CHICAGO • LOS ANGELES
ETHYL CORPORATION OF CANADA LIMITED, TORONTO • ETHYL USA (EXPORT) NEW YORK 17, N.Y.

# You're Talking to Men Who Know

The men of the First City National Oil Department know oil . . . gas . . . petrochemicals. Every phase, from production to marketing! Their broad experience makes it easy to get down to business quickly, to get a decision more promptly, whether you're talking in terms of a modest collateral loan or a complete development program. Come in to see us.

**SOON!** First City National will be serving you in the newest, best equipped, most modern banking quarters in Texas.

## FIRST CITY
## NATIONAL BANK OF HOUSTON

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

# PETROLEUM WEEK

**Publisher**—Ervin E. DeGraff
**Editor**—LeRoy Menzing

**Managing Editor**—Richard M. Machol
**General News**—Robert E. Spann, editor; J. Richard Shaner, Larry Christiansen, Jr., Doris D. Grandelis
**Editor-at-Large**—Wanda M. Jablonski
**Regional Editor**—Glenn Green, Jr. (Houston)
**Exploration, Drilling & Production**—Ade Ponikvar, editor; Jim Bower
**Processing & Petrochemical Editor**—Rene J. Bender
**Pipelines, Tankers & Storage Editor**—Vincent W. De Salvo
**Foreign News**—Georgia Macris, editor; Frederic J. Cassin
**Marketing Editor**—Robert L. Siegel
**Market Trend**—Halsey Peckworth
**District Editors**
*Dallas*—Marvin Reid *Tulsa*—Jim Mayes *Bakersfield*—William Rintoul
*Houston*—Eugene Bush *Chicago*—Stewart Ramsey *Los Angeles*—Kemp Anderson
**Presentation**—William A. Caperell, director; Mildred Schutte
**Editorial Assistants**—Dorothy Miller (Chicago), Carole A. Masucci, Phyliss Lipman
**Librarian**—Helen T. Schaefer **Reprint Service**—Rita Feeney
**Domestic News Service**
*Chicago Bureau*—Bruce Cross, Sheila Rowe
*Cleveland Bureau*—Arthur Zimmerman, chief; Violet Forsha
*Dallas Bureau*—Mary Lorraine Smith, Mae Brown
*Detroit Bureau*—Donald MacDonald, chief; Sally Ayling, Wesley Perry, Jr.
*Los Angeles Bureau*—Michael Murphy, Marvin Petal
*San Francisco Bureau*—Jenness Keene, chief; Donald Winston, Alison Lunt
*Washington Bureau*—George B. Bryant, Jr., chief; Glen Bayless, Dean Reed, D. O. Loomis, Roy Calvin, Seth Payne
*Correspondents:* Anchorage, Austin, Baton Rouge, Billings, Bismarck, Calgary, Casper, Cheyenne, Corpus Christi, Denver, Edmonton, Evansville, Farmington, Ft. Worth, Midland, Mobile, Montreal, New Orleans, Odessa, Oklahoma City, Ottawa, Philadelphia, Pittsburgh, Regina, Salt Lake City, Seattle, Shreveport, Toronto, Vancouver
**Foreign News Service**
*Middle East Bureau*—Onnic Marashian, chief
*Caracas Bureau*—John Pearson, chief
*Bonn Bureau*—Pete Forbath, chief; Silke McQueen, Jim Morrison, Helga Berendt
*London Bureau*—John Shinn, chief; John Tunstall, George Bull
*Mexico City Bureau*—Peter Weaver, chief; Lourdes Marin
*Moscow Bureau*—Ernest Conine, chief
*Paris Bureau*—Robert E. Farrell, chief; Helen Avati, Arthur Erikson
*Tokyo Bureau*—Sol Sanders, chief; John Yamaguchi, Haruko Hosono
*Correspondents:* Amsterdam, Ankara, Bogota, Bombay, Brussels, Buenos Aires, Cairo, Djakarta, Geneva, Guatemala City, Havana, Karachi, La Paz, Lima, Manila, Melbourne, Rabat, Rangoon, Rio de Janeiro, Rome, San Jose, Teheran, Vienna
*Manager, McGraw-Hill World News Service*—John Wilhelm; Margaret Ralston, managing editor
**Economics Dept.**—Douglas Greenwald, manager; Dexter M. Keezer, advisor
**Business Department:** *Advertising Sales Manager*—Donald R. Thompson; *Business Manager*—John E. Thompson; *Western General Manager*—Donald O. Hanson; *Circulation Manager*—Harriet Costikyan; *Promotion Manager*—N. F. Cullinan; *Research Manager*—Leo M. Murray; *Advertising Makeup*—P. J. Callahan
**Other McGraw-Hill Petroleum Publications**
NATIONAL PETROLEUM NEWS PLATT'S OILGRAM NEWS AND PRICE SERVICES

**PETROLEUM WEEK**

**OCTOBER 21, 1960**
**Vol. 11, No. 16**

Published weekly by McGraw-Hill Publishing Co., Inc. James H. McGraw (1860-1948), founder. Publication office: 371 N. Franklin St., Chicago 10, Ill. See panel below for directions regarding subscriptions or change of address.

**Executive, Editorial, Circulation and Advertising offices:** 330 W. 42nd St., New York 36, N. Y. **Officers of the Publications Division:** Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator. **Officers of the Corporation:** Donald C. McGraw, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary.

Subscriptions are solicited only from executives, supervisors, and technically trained personnel in the oil and natural gas industries, who are engaged in exploration, drilling, producing, processing, petrochemical manufacture, transportation, or wholesale marketing. **Position and company connection must be indicated on subscription orders.** Subscription rates for all countries: $3 per year. Single copies 50¢. Second class postage paid at Chicago, Ill. Printed in the U.S.A. Title registered in U.S. Patent Office.


© Copyright 1960 by McGraw-Hill Publishing Co., Inc. All rights reserved.


**Unconditional guarantee:** Our primary aim is to provide subscribers with a useful and valuable publication. Any comment or suggestions for improvement will be most welcome. On written request from any subscriber, the publisher agrees to refund the unused portion of the subscription price.

**Subscriptions:** Address subscription correspondence and change of address to Fulfillment Manager, Petroleum Week, 330 W. 42nd Street, New York 36, N. Y. On address changes please give old and new addresses and zone numbers, if any, and enclose an address label from a recent issue if possible. Please allow one month for change to become effective.

**Postmaster:** Please send form 3579 to Petroleum Week, 330 W. 42nd St., New York 36, N. Y.


## INSIDE Slant

WHO'S CONFUSED?

The visa snafu that delayed the arrival of the Soviet Union's oil team produced some interesting sidelights in New York.

Reporters trying to determine the whereabouts of the missing Russians made hurried calls to a variety of semiofficial and official sources.

One man who represents the Soviets in this country said he knew nothing about the inspection team, and added this colorful comment:

"Try the Soviet U.N. Mission. If you can get past the thick accents and their congenital unwillingness to do anything, you might learn something."

Another call went to Tass, the Soviets' official "news" agency, which supposedly knows and reports everything that's favorable to the U.S.S.R.

Responded an editor: "Oh? They're coming here? We haven't been informed about that."

The real clincher was the Soviet U.N. Mission itself.

No, the press officer isn't in, said the man who answered the phone.

No, he couldn't answer any questions himself.

No, he didn't know anything at all about the visiting delegation of Soviet oil men.

"No," he said, "I don't know anything. I'm just a foreigner here."

LeRoy Menzing
Editor

# Carpenter by day

# PRESIDENTIAL ADVISER by NIGHT

**Officers of Junior Achievement** companies listen as Herman Martin of Standard Oil reviews business principles. Through Junior Achievement, thousands of teen-agers get answers to their questions about business and about the opportunities that exist for young people today. Left to right—Mr. Martin, Ronald A. Mikuly, Robert M. Balog, and Mary Veenhuizen. All live in Whiting, Indiana, except Mr. Martin, who lives in Lansing, Illinois.

Herman Martin is a man who leads two lives. By day he works as a carpenter at Standard Oil's refinery in Whiting, Indiana.

At night, Herman puts the tools of his trade away and becomes an adviser to company presidents, a counsel who can be relied on to help guide up-and-coming businesses through the highly competitive world of commerce.

Yes, Herman Martin is at home giving business counsel to chief executives of Junior Achievement firms because he has been in business for himself and is studying business administration in his spare time.

He enjoys working with these young people who form their own companies and face the many problems of running their own businesses. He and other advisers help them sell stock, buy supplies, get into production, keep books, sell their merchandise, pay wages, earn a profit for their shareholders—and, in short, prepare for successful adult careers.

There are many other Standard employees, dealers, and agents who give their time to help young businessmen. In turn, the company itself sponsors JA activities and other youth programs such as the 4-H and Future Farmers of America. Right now, Standard is sponsoring 34 JA companies in the Midwest area.

We believe that what we do for young people today helps determine what they will do for themselves and their fellow citizens tomorrow. What better way to learn our system of free enterprise and how it operates than to actually participate in it!

**WHAT MAKES A COMPANY A GOOD CITIZEN?**
Looking to the needs of the future and preparing for them is one way a company can be a good citizen. By encouraging youthful enterprise, we can all work together assuring a bright, secure future for America.

**STANDARD OIL COMPANY**
**(INDIANA)**

STANDARD

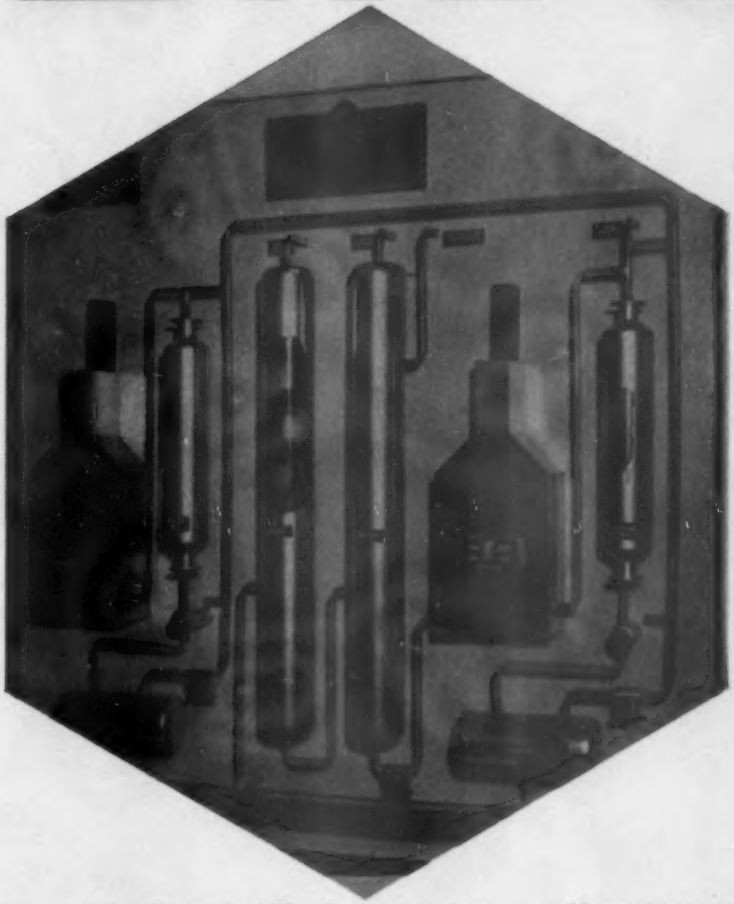
THE SIGN OF PROGRESS—
THROUGH RESEARCH

NOW... MAKE HIGH-VALUE GASOLINE
FROM LOW-VALUE DISTILLATES

*with the versatile new UOP process...*

# LOMAX

TRADEMARK



Model of LOMAX process which produces exceptionally pure, olefin-free products, a predominance of branched isomers—with greatly reduced quantities of light gases plus other important benefits.

Are you suffering from an overabundance of middle distillates? Or producing more vacuum gas oil than you know what to do with? Then your answer may be LOMAX, the flexible new UOP process that lets you make what you want *when you can sell it!*

Through reaction of hydrocarbons with hydrogen in the presence of a new UOP catalyst, LOMAX converts middle distillates into gasoline and distillate fuels—in just about *any ratio you want.* You make as much of each as you can sell, no more, no less.

UOP's highly flexible new LOMAX process may be used to supplement existing facilities, or as a basic cracking operation in a new installation. UOP engineers will work with you in preparing a case study showing how LOMAX will fit into your refining picture. Write, wire or phone for details.

UOP
UNIVERSAL OIL PRODUCTS COMPANY
30 Algonquin Road, Des Plaines, Illinois, U.S.A.

WHERE RESEARCH TODAY MEANS PROGRESS TOMORROW

NOW

4 / 41 / 89 / 16 / 12 / 2 / 17
98 / 13 / 65

# What these "Hallmarks of Quality" on the parts of every W-K-M Valve mean

Examine any important part and you'll find stamped in the metal the *personal* seal of each W-K-M craftsman who worked on it.

These marks denote a pride of workmanship that gives you greater assurance of trouble free service. For quality must be built into a valve on the *production line* as well as on the drawing board.

To achieve the unique personal responsibility of every man at W-K-M takes *human* engineering. It is a vital part of TOTAL Valve Engineering—W-K-M's unique dedication to *all* phases of valve technology. Another reason why W-K-M Valves work better, last longer . . . on the world's toughest jobs.

W-K-M

DIVISION OF ACF INDUSTRIES
INCORPORATED
P. O. BOX 2117, HOUSTON, TEXAS

6004

# *INTRODUCING...*

# The ALL-NEW BETHLEHEM SERIES "60"

## *A bold new concept in pumping unit design*

**TRUSS-TYPE STRUCTURE**—Base, samson post, and reducer support of the new Series "60" are integrated to form a truss, a design which achieves maximum rigidity and strength per pound of structure.

**VERTICALLY-SPLIT REDUCER**—Two-piece case, split on vertical center line, permits direct mounting of anti-friction bearings for maximum accuracy of gear, bearing, and shaft alignment.

**NEW COUNTERBALANCE CRANKS**—New design with multiple filler-weight sections permits great flexibility and top economy in counterbalance selection, and facilitates adjustment from interior servicing platform.

**MAXIMUM CAPACITY-TO-WEIGHT RATIO**—Truss-type structure, long-radius cranks, and vertically-split reducer provide maximum torque and well-load capacity per unit of weight, thus minimizing transportation and erection costs.

**CONVENIENT SERVICING PLATFORM**—Centrally located in samson post, the service platform provides a safe, convenient working position for counterbalance and stroke adjustment, and for reducer inspection and servicing.

**PRE-LUBRICATED BEARINGS**—Saddle, tail, and wrist pin bearings are all Bethlube bearings—pre-lubricated during assembly for long, service-free operation.

**RUBBER-MOUNTED EQUALIZER**—Equalizer and self-positioning tail-bearing are mounted on rubber pads. This, together with hinged upper-pitman connections and self-aligning, roller-bearing wrist pins, provide for perfect alignment.

**FOLD-UNDER HORSEHEAD**—Hinged horsehead folds under walking beam and returns to pumping position by operation of a latch mechanism from ground level. In well servicing, this safety feature eliminates the need to climb on unit.

**MINIMUM CUBAGE**—Truss structure of the Series "60" knocks down into single beam sections, permitting compact packaging. This reduces cubage and cuts transportation costs to a minimum.

*All these new features make the new Series "60" the best buy on the market. For more information, check with the Bethlehem store in your area. Or write to us direct.*

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY • SUPPLY DIVISION

General Offices and Export Dept.: 21 East Second St., Tulsa, Okla.

*Canadian Distributor:* Bethlehem Supply Company of Canada, Ltd., Calgary, Alberta, Canada

# BETHLEHEM STEEL

## SUPPLY DIVISION

Congrats and $25 to Mr. D. J. SUGGS, Republic Natural Gas Co., Tipton Bldg., Pauls Valley, Okla., for this quip.

Joe Roughneck is top kick of the industry . . and plenty tough in his pipe demands.

He likes the plus factors he gets in using Lone Star electric weld pipe: convenient source of dependable supply, overnight delivery and rigid quality control through exacting multiple tests.

Sound, strong, lasting pipe you can depend upon: API casing, tubing and line pipe from Lone Star.

**Neighbor, wherever you are, specify Lone Star and we both get a good deal.**

©1956 Lone Star Steel Company

Lone Star STEEL COMPANY

EXECUTIVE—SALES OFFICES
W. Mockingbird Lane at Roper • P. O. Box 12226 • Dallas, Texas
DISTRICT SALES OFFICES
912 Republic National Bank Building, Dallas, Texas
Houston, Texas | Midland, Texas | Tulsa, Oklahoma

# Views That

Dear Sir:

I have been out of my office for a few weeks and your Inside Slant, "It's the Law That Rules" [PW—Aug.12 '60,p3], has just come to my attention.

Before our conservation laws were adopted, an operator could drill as many wells as close together as he desired. If a neighbor was draining him, this operator could simply drill enough wells to stop that drainage. He had the remedy of "unlimited self help." However, in those days fields were rapidly drained of their flush production, reservoir pressures were prematurely dissipated, and many fields were abandoned in a very short period of time.

Our conservation rules and regulations contain a famous provision known as Rule 37. It is the statewide spacing rule and simply says, first, that no well for oil or gas shall be drilled nearer than 933 ft. to another well completed in or drilling to the same horizon on the same tract or farm, and second, that no well shall be drilled nearer than 330 ft. to any property line, lease line, or subdivision line. In a particular field, the pattern as set by special field rules may be larger, and thus these distances may be greater.

In order to make Rule 37 constitutional, the rule contains an exception. This exception provides that in order to prevent waste or to prevent confiscation of property, the Railroad Commission may grant exceptions to permit drilling within shorter distances than those prescribed in the rule.

Rule 37 is absolutely silent as to how much oil or gas may be produced from any well drilled, either under the spacing pattern adopted for a field or as an exception to Rule 37. This is very important to remember, for much confusion arises over the contention of owners of segregated small tracts that in some fashion Rule 37, when taken with the Law or Rule of Capture, requires that the operator who drills on a segregated tract be allocated a quantity of oil or gas sufficient to pay for the well and return a profit.

As fantastic as such a contention sounds in the light of simple exception to Rule 37, it is repeatedly made. It is contended that if such allocation is not made, then the exception is meaningless and confiscation results despite the exception. I would like to make it clear that I am not opposing Rule 37 or the exception thereto.

# Make News

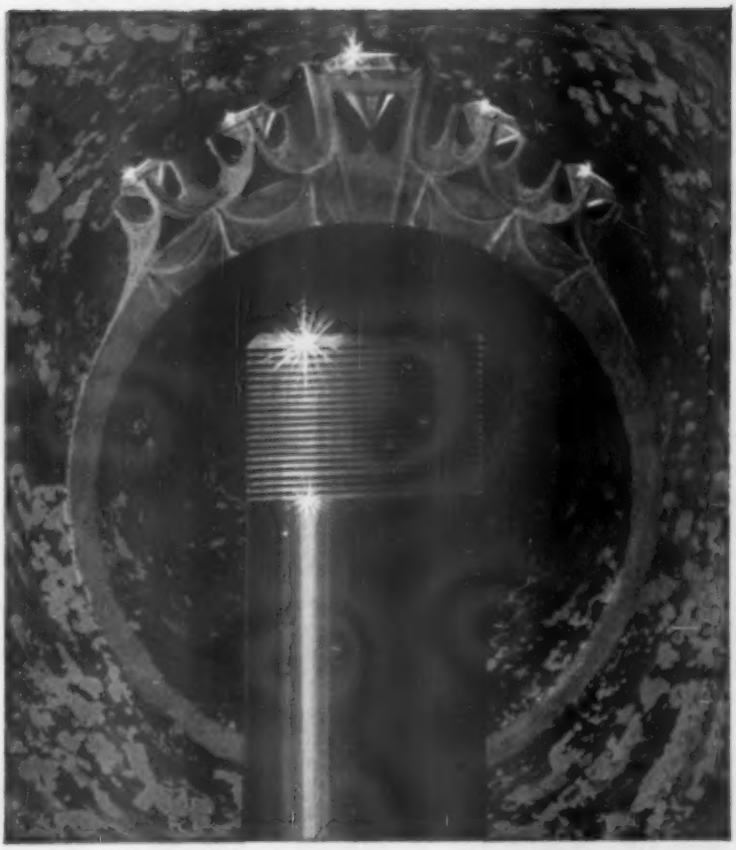
The confusion that exists as to just how much oil or gas the owner of a well should be entitled to produce from a segregated tract is further compounded by misinterpretations of the "Rule of Capture." The Law or Rule of Capture is court-made law. It was not passed by the legislature and is not contained in a rule or regulation. But let me say that I consider the Rule of Capture a profound and useful conservation measure.

The courts have defined this rule or law very clearly as follows: "The Rule of Capture is simply this—that the owner of a tract of land acquires title to the oil (or gas) which he produces from wells drilled thereon, although part of such oil or gas may have migrated from adjoining land." In other words, the owner whose well the oil is produced through or from does not have to account to his adjoining owners for such oil, although it may have migrated to the well from the adjoining tracts. However, this very simple rule has come to mean many things to many people.

The most serious misunderstanding in the application of this rule presently current is the assertion by town-lot and segregated small tract operators that the rule means more than non-accountability to adjoining owners. These people contend that it confers an affirmative absolute right of a well owner to drain oil and gas from his neighbor. These people contend that the allocation formula must afford the single well on a segregated tract enough production from that well to pay for the well plus a profit, even though that amount is not originally in place under the tract and will clearly have to be drained from adjoining tracts. Such language of the court contained in the Hawkins case is pointed to as authority for this fallacy.

The courts have repeatedly said that "fair share" means the approximate amount of oil or gas underlying a particular tract. Therefore, according to the interpretation of the courts, an allocation formula is confiscatory and unlawful if it does not allocate to all wells in a reservoir approximately the oil or gas in place under the tracts upon which such wells are located. Yet this interpretation is misconstrued and is not taken into consideration by those who have the power to use it, namely, the Railroad Commission.

MICHEL T. HALBOUTY
*Independent producer*
*Houston*



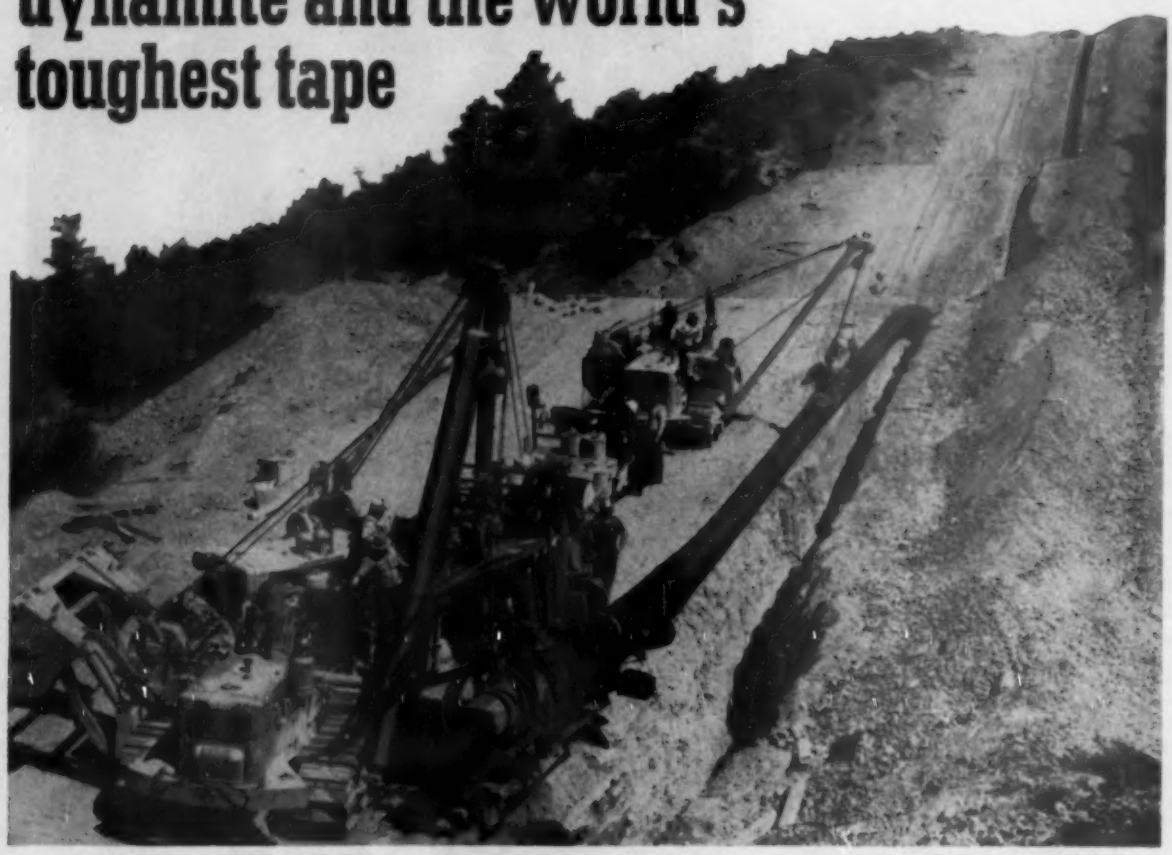
GEM
OF THE
OIL AND GAS
INDUSTRY

Threads on Lone Star API casing, tubing and line pipe are cut with custom-jewelist precision.
Lone Star men are more than mere steelworkers . . they are true craftsmen. They take personal pride in their work and in their fine products.
Oil and gas men, on the other hand, appreciate Lone Star pipe because it is a fine, dependable product, and because its convenience and availability right here in the oil country save much precious time. Truly . . the gem of the oil and gas industry.

Lone Star STEEL
COMPANY

EXECUTIVE—SALES OFFICES
W. Mockingbird Lane at Roper • P. O. Box 12226 • Dallas, Texas
DISTRICT SALES OFFICES
912 Republic National Bank Building, Dallas, Texas
Houston, Texas | Midland, Texas | Tulsa, Oklahoma

# Jobs this rough need mountain climbers, dynamite and the world's toughest tape



## New Mandalay line protected by Polyken Extra-Strength #960

Putting in Richfield Oil's Mandalay Line was as mean a job as we've ever seen.

The line runs from sea level to points up to 8,300 feet in the mountains of Southern California, with grades over 40%. In places the trench was blasted out of solid rock. It took rugged crews to put the line in and a rugged tape to protect it.

On the recent big Florida Line and other lines in America, on lines in Canada and in Iran, Polyken has proven itself the most practical and economical protection you can put on a pipe.

Polyken tape pays off in performance—and in the currency of less men, less equipment, greater efficiency, more footage per day during construction. With tensioned-spindle equipment, pipe is cleaned, wrapped and over wrapped in one factory-smooth operation. Tape's ready. No primer, no drying or cooling, no fumes or fire hazard—none of those hot-dope problems.

Before you plan your next job, we'd like to tell you more about Polyken Extra-Strength #960. Call the Polyken distributor nearest you, or write Polyken, 309 West Jackson Blvd., Chicago 6, Illinois.

Polyken Tapes can be applied swiftly, easily, effectively, even under extreme conditions. This mountain-country coating went on with flat-country simplicity. That's why more contractors and pipeline managers are specifying Polyken.

THE MODERN WAY

Polyken®

EXPERIENCED IN PROTECTIVE COATINGS

THE KENDALL COMPANY
Polyken Sales Division

1960 The Kendall Company

## modern, efficient catalytic sweetening

# at a CHEMICAL COST of 1/2 CENT per BARREL!

## BENDER Catalytic Sweetening Process

The effective sweetening of distillates in the gasoline, kerosine, burning oil range can be accomplished by the BENDER process for approximately one-half cent per barrel for all chemical costs, including catalyst maintenance. (Installation cost also is low, ranging from $15 to $30 per barrel/day of throughput.)

Beyond these obvious cost advantages, the Petreco* BENDER process is simple to operate and maintain.

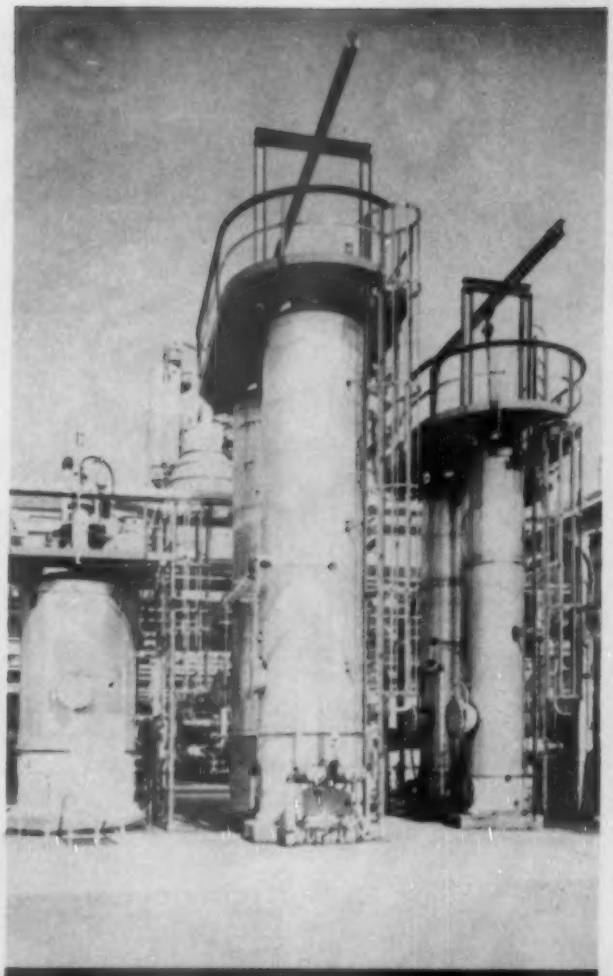
**OTHER ECONOMIES OFFERED BY BENDER PROCESSING:**

- *Automatic control . . . minimal operating attention.*
- *Long catalyst life . . . simple on-the-site reactivation.*
- *No product loss.*
- *Freedom from copper contamination.*
- *Sweet, non-corrosive product.*
- *No stream or air pollution.*

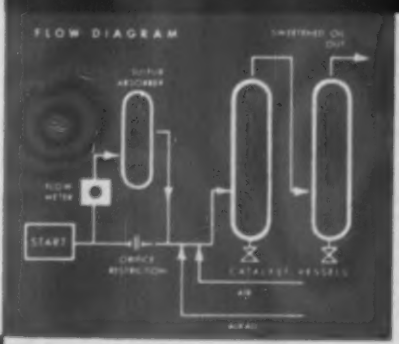
Complete information on request. Write for new Petreco Distillate Treating Booklet.

*Registered Trademark, Petrolite Corporation

B-60-1



HOW BENDER CATALYTIC SWEETENING WORKS




*Controlled quantities of sulfur, alkali and air are added to the product stream. The resulting mixture is passed through a Petreco* catalyst bed. The process sweetens by converting mercaptans to disulfides by oxidation—in an automatic, continuous operation.*

**PETROLITE CORPORATION**

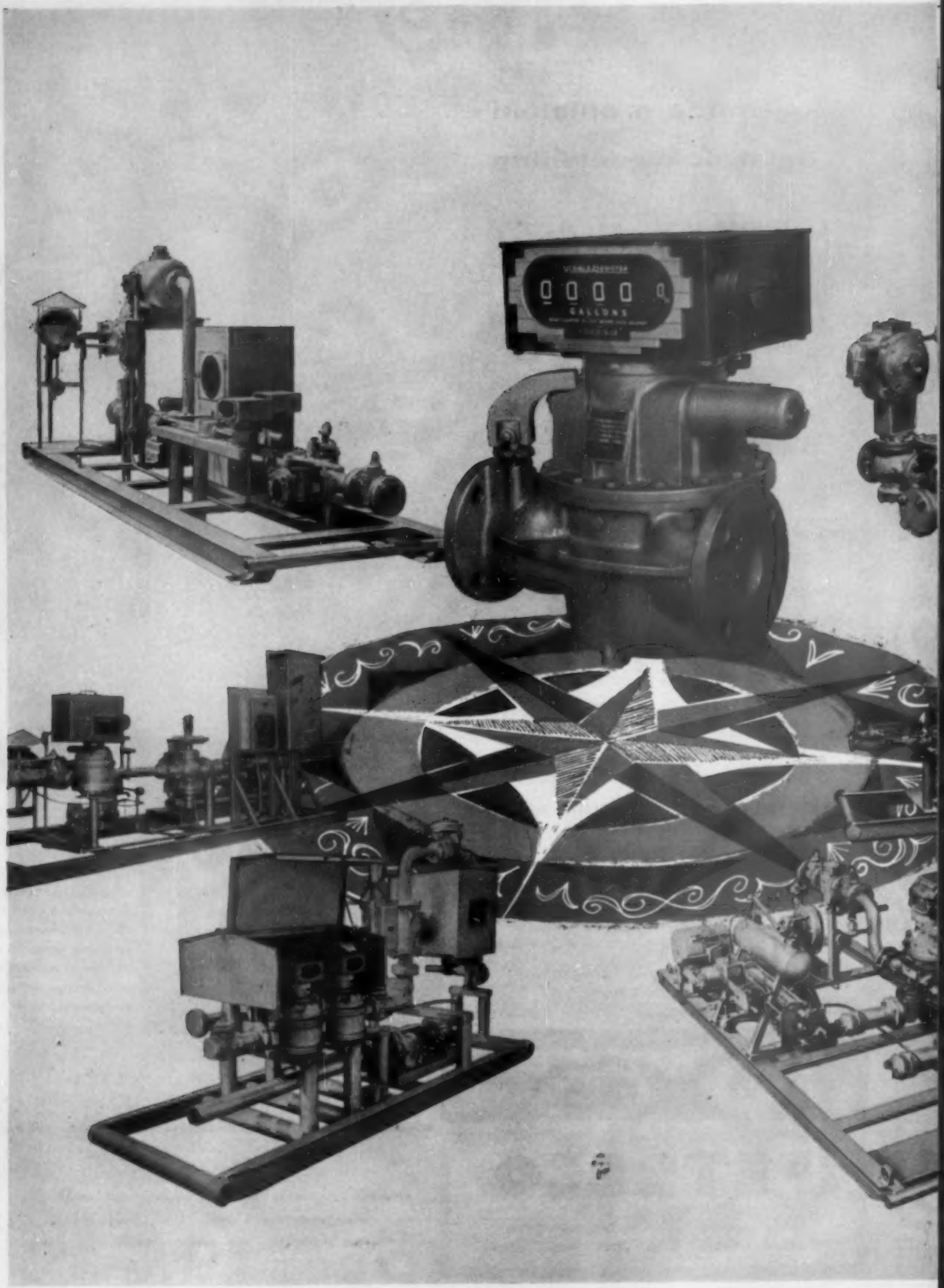
SUBSIDIARY AND AFFILIATED COMPANIES

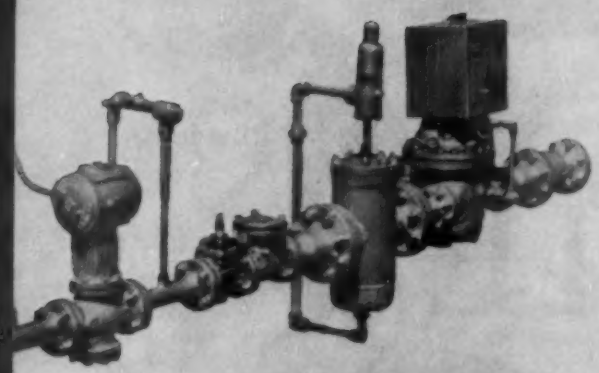
**CANADA**, Edmonton, Alberta • **ENGLAND**, London
**GERMANY**, Frankfurt, a. M. • **VENEZUELA**, Caracas

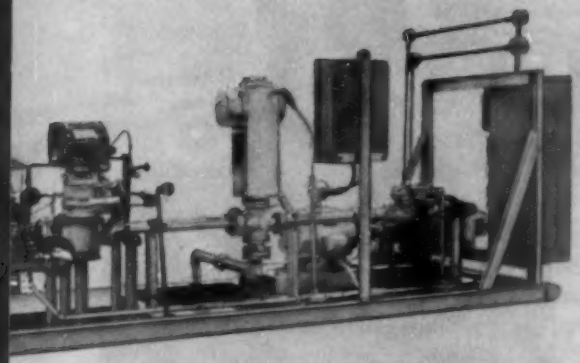
**PETRECO**
DIVISION
3202 South Wayside Drive (P.O. Box 2546), Houston 1, Texas
1390 East Burnett Street (P.O. Box 7216), Long Beach 7, California

REPRESENTATIVES

**ARGENTINA**, Buenos Aires • **BRAZIL**, Rio de Janeiro • **COLOMBIA**, Bogota
**ITALY**, Rome • **JAPAN**, Tokyo • **KUWAIT**, Kuwait • **MEXICO**, Mexico, D. F.
**NETHERLANDS**, The Hague • **PERU**, Talara • **TRINIDAD**, Port of Spain


GALLONS





# NO LACK OF L.A.C.T.

## LEADING COMPANIES EVERYWHERE KEEP THE RECORD STRAIGHT WITH L.A.C.T. METERS BY SMITH-ERIE

It's the automatic choice at lease holdings from coast to coast – Lease Automatic Custody Transfer systems with precision metering by Smith-Erie.

As close to foolproof as modern science can make them, Smith-Erie L.A.C.T. meters afford undisputable transfer evidence for royalty owner, producer, pipeliner, etc. Economical, too! L.A.C.T. systems do away with costly lease tankage systems ... reduce manpower required to hand gauge tanks.

Smith-Erie leads in L.A.C.T. as it does in metering all along the line. Pick a transfer point! Well-site ... refinery ... bulk plant ... truck ... service station – you can be sure of uninterrupted high flow and sustained accuracy with Smith-Erie meters on the job. For the complete meter story, contact your representative or write direct.

*Through research ... a better way*

**A.O.Smith**
CORPORATION
**Smith-Erie Division**

Factory: 1602 Wagner Ave., Erie, Pennsylvania. Offices: Atlanta 5, Ga.; Chicago 3, Ill.; Houston 2, Texas; Los Angeles 22, Calif.; New York 17, N.Y.; Newark, Calif.; Tulsa, Okla. Canada: Toronto 12, Vancouver 1. A. O. Smith INTERNATIONAL S.A., Milwaukee 1, Wis., U.S.A.

The Cameron Automatic Safety Valve on a Christmas tree wing protects unattended lease equipment 24 hours a day — effectively safeguarding Products, Property and Profits • High Well Pressure is kept under constant positive control to protect — and guard against malfunction — all equipment downstream from the tree • When pressure drops or rises beyond preselected points the Cameron Automatic Safety Valve closes with a firm regulated action • Control pressure may be in the valve body itself or from a remote source • A manual control provides instant overriding action for conventional operation or resetting

# COMPLETE WELL CONTROL

CAMERON AUTOMATIC SAFETY VALVE

The Cameron Automatic Safety Valve assures unequaled safety, performance and economy.

1. Simple, rugged design — only three main moving parts.
2. Accurate performance over extended periods without readjustment.
3. High and low trip points are independently adjustable.
4. Manual operation permits simple, fast choke changing.
5. Proven by almost three years of punishing field tests.

A Cameron Representative will show you how this valve will give you more protection *and* save you money.

Cameron

CAMERON IRON WORKS, INC.

P. O. Box 1212 Houston, Texas

Plants and Sales Offices throughout the world

# 60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

October 21, 1960

## dept/INDEX


| | |
|---|---|
| Production | 37 |
| Pipelines | 86 |
| Processing | 69 |
| Marketing | 101 |
| Washington | 34 |
| Statistics | 95 |
| The Market Trend | 96 |
| Key Prices | 98 |
| Editorial | 112 |
| International | 79 |
| Personals | 106 |
| Service & Equipment | 108 |
| Petroleum Comments | 28 |


**With the air cleared for the moment on gas prices, the Federal Power Commission is turning its attention to reserves.** It is studying alternate methods of computing reserves—away from the conventional volumetric method used in rate cases. . . . p. 23

•

**Worldwide price dictation by oil exporting nations is the goal of a plan advanced by Saudi Arabia's Tariki** at this week's Arab Oil Congress. It would divide world crude markets between Venezuela and the Middle East roughly on a hemispheric basis. . . . p. 28

•

**A full string of aluminum drillpipe, fitted with special steel joints, has passed its first commercial field test.** It was used to drill a 10,400-ft. hole in Southwest Texas. . . . p. 37

•

**French companies are making plans to refine their Sahara crude in Belgium.** Products would be marketed in Belgium, the Netherlands, and West Germany. . . . p. 79

•

**California Standard is reducing the number of company-operated stations and swinging to more dealers.** The reason: Better dealers are available today. . . . p. 101

•

**Gas producers are pushing the Federal Power Commission for fast rulings under its area price plan.** They appear willing to accept the ceilings to save time. . . . p. 25

•

**Timing is of importance when fracturing to boost recovery from waterfloods.** Research on one project indicates recovery might have been doubled by earlier fracturing. . . . p. 44

•

**Petrochemical operations can best be handled by a chemical division or subsidiary.** That's what many oil companies have found after having entered petrochemicals through their processing divisions. . . . p. 69

•

**Helicopters, which have been used to string pipe, have proven valuable in pipeline repairs.** The advantages are most pronounced in hard-to-get-to areas. . . . p. 86

•

**Humble Oil & Refining has no immediate plans for a national brand name.** It is more interested in getting nationwide acceptance of its corporate name, at least for now. . . . p. 25

•

**The Justice Dept. is only interested in the reduction in competition when investigating acquisitions,** it's antitrust chief declared. . . . p. 26

# Up to the Minute

## SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK

October 21, 1960

**Coal interests won a major victory this week in their battle to stem the inroads of fuel oil into eastern electric generating plants.** The Interstate Commerce Commission refused to upset a 50¢-a-ton freight-rate reduction granted by coal-hauling railroads for Appalachian coal transported to 14 large electric utilities. An alliance of mine operators, railroads, and utilities said that with the freight-rate reduction residual fuel would win a substantial share of coal's largest remaining domestic market.

**Observers predict that an appeal to the courts is likely** by the oil jobber group opposing the special rail rate for coal. The reduction was made in March, 1959, on a temporary basis. It was limited to utilities buying more than 3-million tons annually. The utilities also received a 25¢-a-ton cut in coal prices. ICC, concerned only with the rail-rate cut, ruled with only one dissent that the reduction did not violate antitrust laws.

•

**The Oil, Chemical & Atomic Workers' Canadian locals are seeking an 18¢-an-hour wage hike,** matching the requests being made in the U. S. The bargaining program of the Canadian District Petroleum Council also calls for longer vacations and higher severance pay. The Canadian locals received their last general wage hike of 4% in March, 1960, 14 months after the general wage increase in the U. S. Most Canadian contracts will be open between December and April for negotiations on new goals.

•

**The trial of 13 companies charged with retail "price fixing" opens in U. S. District Court at South Bend, Ind., Nov. 1.** The October, 1958, indictments charge the companies with conspiracy to raise gasoline pump prices with the "aim of ending a price war." The alleged actions took place in the spring of 1957. The first indictment, handed up in the fall of 1957, was thrown out by Judge Robert A. Grant, now disassociated with the case by Justice Dept. request, on the ground that the grand jury had been improperly impaneled.

•

**A Tennessee Gas Transmission Co. subsidiary has acquired Renwar Oil Corp. in exchange for 800,000 shares of TGT common stock.** Tennessee-Texas Oil Co. acquired the Renwar's interests in 27,750 developed and 360,659 undeveloped acres, along with one gas dehydration plant and minority interest in two natural gasoline plants. Renwar's assets included $3.5-million in cash.

•

**Another Canadian company—Hudson's Bay Oil & Gas Co.—wants to build a natural gas liquids line to the U. S.** This makes the fifth applicant seeking such permission from the Alberta Oil & Gas Conservation Board. Hudson's Bay, owned 68% by Continental Oil Co., proposes to build 41 mi. of line from southwestern Alberta to the international boundary. It would connect in the U. S. with a 433-mi. crude line to be built by Continental Pipe Line Co. from Cut Bank, Mont., to a connection with the Platte Pipe Line system in Wyoming (page 87).

# McCULLOUGH SALINITY LOG

## *with scintillometer®*

## *...a nuclear log that tells* OIL *from* SALT WATER

The McCullough Salinity Log determines the presence and degree of saline fluids in formations surrounding the bore-hole. It will distinguish between oil and salt water and can be used in open or cased hole. Providing hole diameter is not extreme, it may be used where air or gas or highly saline fluid was used for drilling.

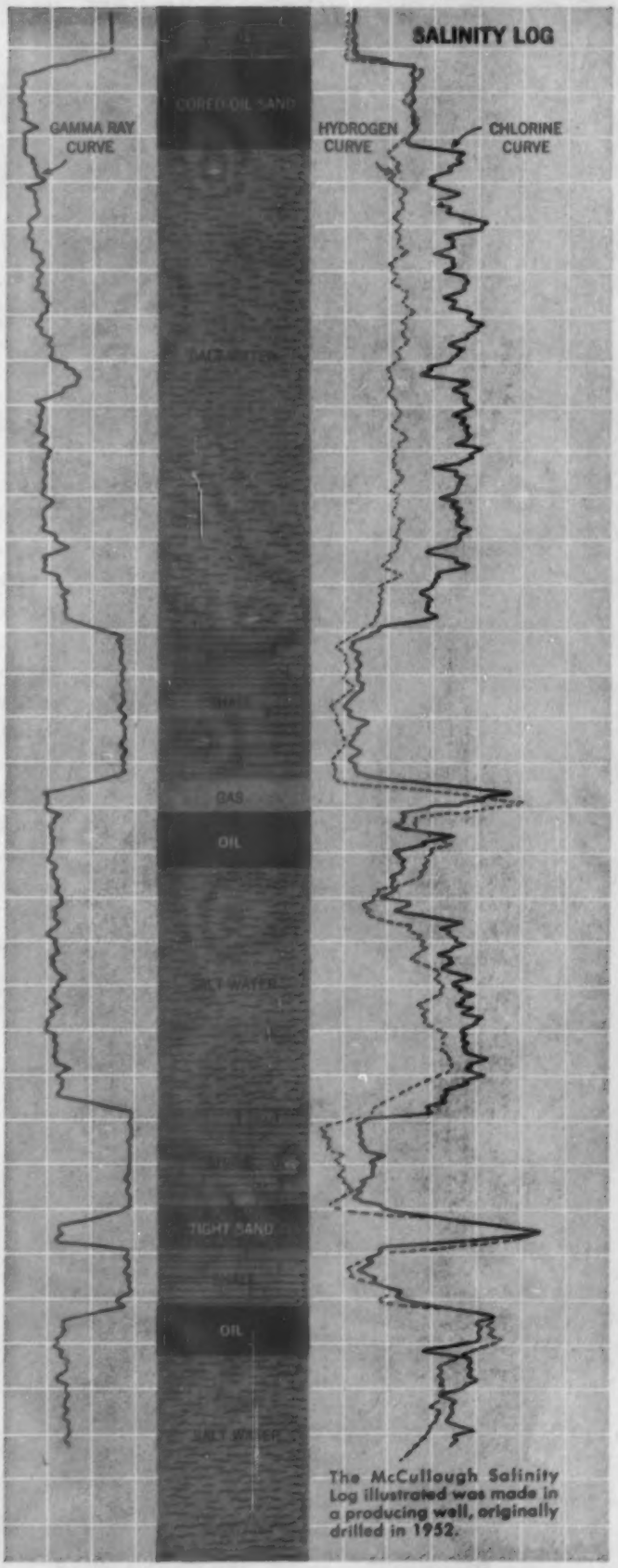
A "chlorine" curve and a "hydrogen" curve are recorded simultaneously at the same depth elevation with a single detector. These curves are compared to indicate the amount of salt, NaCl in particular, that is present in the formations being investigated. In potential oil bearing formations the absence of salt is indicative of the presence of oil.

The recording of the two curves simultaneously is considered essential. It eliminates the possibility of a depth discrepancy between two curves which are recorded separately. It also insures the recording of information under identical physical conditions—of extreme importance in interpreting the two curves.

A higher counting rate and greater instrument efficiency allows an increased spacing (23¾ in.) between the source and the Scintillometer. This provides the added benefit of a proportionately larger zone of investigation.

### *Take a look at these features:*

- **Distinguishes between salt water and oil in liquid bearing formations.**
- **Determines the degree of salinity in formation fluid.**
- **Identifies salt water zones that must be blanked off.**
- **Makes possible water saturation calculations for potential oil bearing zones.**
- **Shows salt water and oil zone contact under suitable conditions.**
- **Aids in determining gas/oil contact.**
- **Helps determine if it is economically practical to set casing on new completions.**
- **Aids in evaluating correct depth to set casing string.**
- **Accurately re-evaluates old wells to locate potential cased-off production.**
- **A reliable tool for porosity determination.**




The McCullough Salinity Log illustrated was made in a producing well, originally drilled in 1952.

**McCullough**

**TOOL COMPANY**

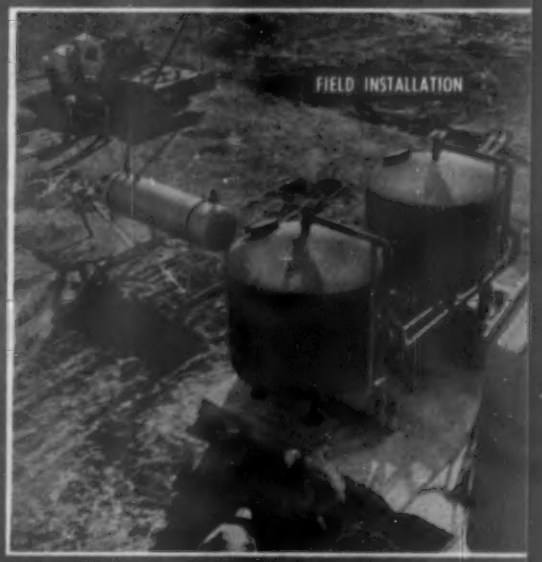
Los Angeles • Houston • Edmonton

*Cable Address:* MACTOOL

*MID-CONTINENT SUPPLY CO.*

# SUPERMARKET for SERVICES, TOO!

**Mid-Continent "Supermarkets" have everything . . . including thousands of supply and equipment items plus SERVICES, too. Our supply service in the field includes handling orders or instructions through a two-way radio network from mobile to field store or office to quickly supply your requirements. Factory-trained personnel stand ready 24 hours a day to assure machinery field service . . . making repairs on location if possible. Field installation, an important sales service, is provided by qualified personnel for complete projects. Supplementing the sales organization, Mid-Continent's engineering staff offers technical assistance and designs equipment for your exact needs. And, for international customers, multi-lingual personnel are an important part of our organization. These are SUPERMARKET SERVICES! Your needs are quickly and economically supplied at the sign of the familiar neon derrick on your Mid-Continent "Supermarket" . . . a symbol of sure service around the world.**

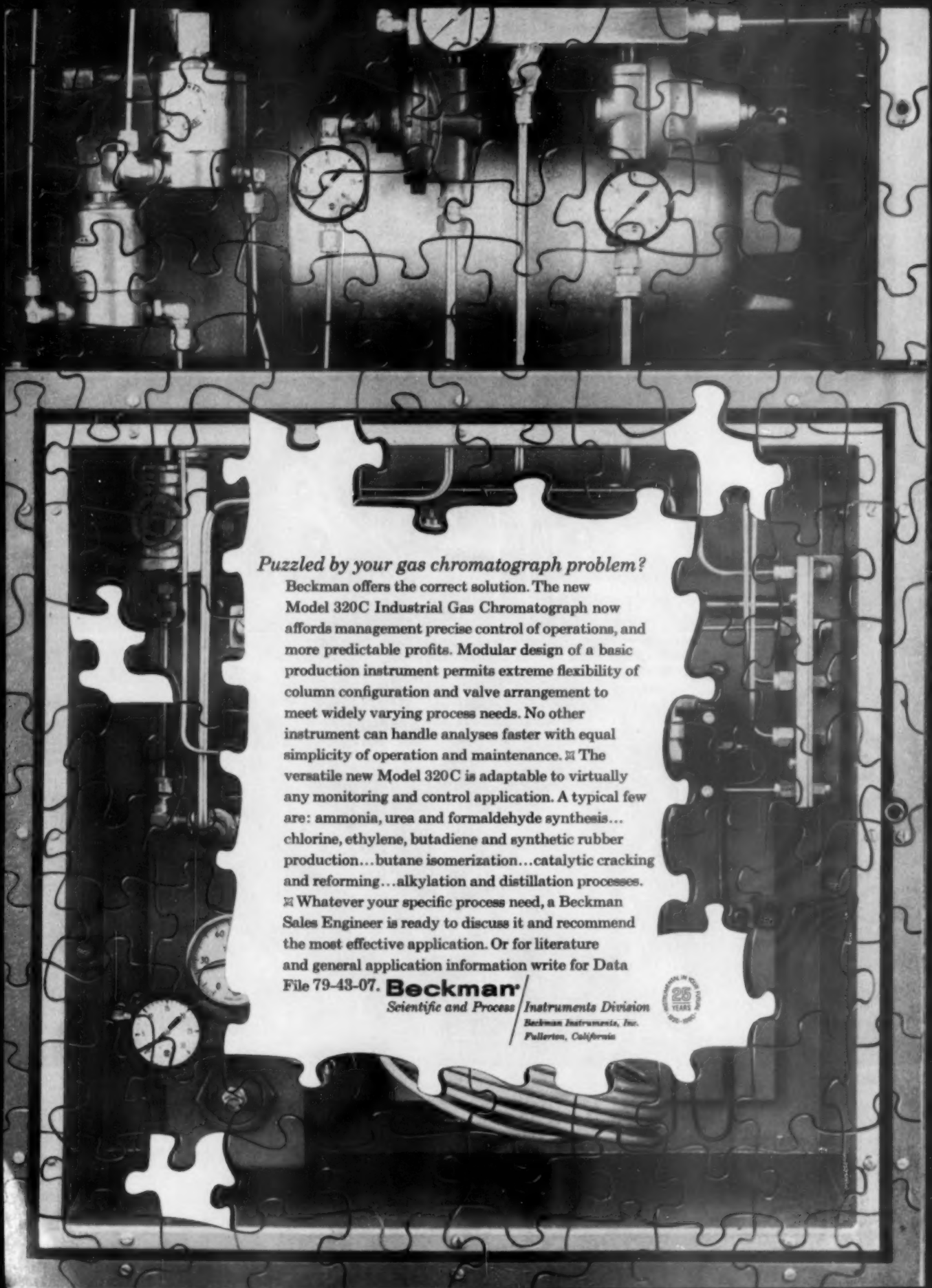



SMS-O

# MID-CONTINENT SUPPLY CO.

*THE WORLD'S LARGEST INDEPENDENT OIL FIELD SUPPLY COMPANY*

Mid-Continent Building, Fort Worth, Texas • Export Division: 45 Rockefeller Plaza, New York 20, N.Y. Cable: MIDCUMPORT NYK


*Puzzled by your gas chromatograph problem?*
Beckman offers the correct solution. The new Model 320C Industrial Gas Chromatograph now affords management precise control of operations, and more predictable profits. Modular design of a basic production instrument permits extreme flexibility of column configuration and valve arrangement to meet widely varying process needs. No other instrument can handle analyses faster with equal simplicity of operation and maintenance. ¤ The versatile new Model 320C is adaptable to virtually any monitoring and control application. A typical few are: ammonia, urea and formaldehyde synthesis... chlorine, ethylene, butadiene and synthetic rubber production...butane isomerization...catalytic cracking and reforming...alkylation and distillation processes. ¤ Whatever your specific process need, a Beckman Sales Engineer is ready to discuss it and recommend the most effective application. Or for literature and general application information write for Data File 79-43-07.
Beckman
Scientific and Process / Instruments Division
Beckman Instruments, Inc.
Fullerton, California
25 YEARS

# Regulators Turn to Gas Reserves

## The Federal Power Commission is studying alternate methods of computing reserves. Any change would have a broad impact.

**Is the Federal Power Commission staff shifting away from the conventional method of estimating natural gas reserves? Several recent developments have industry experts guessing.**

At this point, it is difficult to say one way or the other. There actually hasn't been any clear-cut departure from custom yet.

Some of the recent approaches that might point to a new attitude have been used by the FPC staff before in isolated instances, but did not then become policy building blocks.

Within the past few months, however, several staff—and commission—actions have seemed to point to a possible change in attitude toward reserves and deliverability capability.

**If a new policy is shaping up, it would have an impact across the board, from wellhead to burner tip—and even in the financial area.**

Theoretically, at least, any interstate pipeline is subject to a re-examination of its reserves. If the methods the industry has used over a long period of time now are considered inadequate, every segment involved is bound to feel the impact.

For example, a transmission company will frequently contract with a producer for gas for which it has no immediate need, but which it will use in the future.

If current indications do point to a new FPC policy, transmission companies face a problem in making such contracts. For indications are that such reserves for future use could not be counted in transmission companies total reserves to substantiate planned expanion programs.

"There isn't any question about its being a problem," comments an official of one pipeline firm. "We aren't involved in anything right now with FPC concerning our reserves. But we may be eventually.

"Any time you ask for a certification for expansion, you can be hit with another look at your reserves.

"This will affect the producers, the pipelines, the distribution lines, the consumers, the bond holders, and the stockholders—everybody."

**FPC took a glancing swipe at estimation procedures in its decision on Phillips Petroleum Co.'s rates.**

Discussing the proposed "Reserves Added Realization Method" of allocating exploration costs, the commission said:

"RAR has a very serious administrative disadvantage, in that it is very difficult to estimate the size of the gas and oil reserves of a producer. Experience has shown that experts differ substantially as to the size and deliverability of the reserves.

"Furthermore, the estimates are inherently subject to periodic change as a result of experience with the lease or field involved."

**Perhaps the most significant indication, however, that a new course may be in the making is a current proceeding involving Transcontinental Gas Pipeline Corp.**

At the moment, this action is unresolved. It is the subject of a "joint study" between Transco and the FPC staff.

Here's what's involved:

Transco filed for permission to undertake a $52.6-million expansion program.

The commission remanded the proceedings to an examiner two months ago and ordered a "joint study" between Transco and the FPC staff of the company's "over-all gas supply."

Among the questions underlying the commission action is the manner of computing reserves and deliverability.

**Traditionally, the industry has relied on the volumetric method for computing reserves. This has become accepted practice for just about every purpose, ranging from regulatory requirements to financing.**

The amount of reserves in place is calculated by considering the thickness of the pay zone, the areal extent of the deposit (determined by a shooting picture or subsurface data, usually, in the absence of other information), and such factors as porosity, temperature, bottom-hole pressure, shrinkage (a function of bottom-hole pressure and richness of the gas), and connate-water saturation.

The bulk of this data comes from testing procedures and analysis of logs, core samples, etc.

**Now, the FPC staff apparently favors the pressure-decline or flow-test method for calculating gas reserves.**

The pressure-decline method means, simply, plotting bottom-hole pressure against production over a period of time.

The smaller the reservoir, the greater the drop for a given volume withdrawal of gas.

In some instances, after adequate withdrawals from the reservoir, this method is more accurate than the volumetric system—but not always, as in the case of a water-drive field.

Flow-testing means the actual measurement of the capability of a reservoir to produce. Necessarily, it entails the production of a sufficiently large volume of gas over a sufficiently long period of time to establish the capability.

**Many industry experts agree that the pressure-decline factor should be used when possible, at least for confirmation. But the question is: What happens when it can't be used?**

In most instances, where a difference occurs between the pressure decline and the volumetric estimate, the pressure-decline procedure is considered the more accurate. It is not infallible, however.

And how do you have a pressure-decline factor in a new field where perhaps only one or two gas wells have been completed?

The way things seem to be shaping up, it may be that such wells would have to be flow-tested, connection or no connection, in order to establish a pressure-decline factor.

**In the Transco situation, the record**

**reflects some yawing back and forth. At one time, the company's reserves estimate seems to have been accepted.**

In June, 1959, in issuing a temporary certificate, FPC told Transco that it would have to establish "the deliverability of its gas supply" before going ahead with any additional expansion plans.

Since FPC later issued a permanent certificate for this program, it is obvious that Transco must have complied fully with that requirement.

**As recently as last August, an FPC examiner confirmed the finding of adequacy of Transco's reserves.**

Transco had estimated that on next Jan. 1, it would need 10.1-trillion cu. ft. of reserves to meet its needs for 20 years for its proposed expansion. The company said it would have 8.1-trillion cu. ft. by that date, giving it a 16-year reserve life.

"As to deliverability, Transco expects no deficiency in meeting annual system requirements before 1973 with reserves now on hand," Robert M. Weston, the presiding examiner, said.

Noting that Transco's estimates were based on the conventional volumetric method, Weston found "no indication" that Transco's chief reserves witness, George T. Rabson, "has overstated, or otherwise distorted, his clear and expert convictions."

The examiner pointed out that the FPC staff used a "depletion mechanism" and "deleted all non-flow-tested reserves" in contesting Transco's estimate.

**A few weeks later, FPC ordered a whole new study of Transco's reserves. That proceeding is now under way and could continue for a long time.**

The commission sent Transco's application back to the examiner on the ground that the "evidence of gas supplies" was "inadequate to justify certification of the proposed facilities," and ordered a joint study, by Transco and the staff, of "Transco's over-all gas supply."

The key, though, in the FPC order on reserves estimation methods was this:

"Transco has included, and the examiner accepted without reservation, 292,835,000,000 cu. ft. of non-flow-tested reserves. The examiner again noted correctly that flow-testing is not a 'sine qua non' of gas supply.

"However, as we indicated in our Trunkline decision (21 FPC 704), non-flow-tested gas-supply estimates are not fully acceptable either. We have no doubt that substantial amounts of gas will eventually be recovered from the non-flow-tested sources, but there is no assurance that the estimated volume of 292,835,000,000 cu. ft. will be available.

"But where the over-all supply situation of the pipeline is as critical as Transco's, we cannot allow the attachment of additional consumers, based on the speculation generated by other and less reliable tests."

Apparently Transco would have produced considerable evidence on this point had it been requested to do so in advance of its direct presentation.

**The question of just what FPC has in mind hasn't emerged clearly yet.**

Considering the Transco case alone, there are other reserves issues involved: contracted but unconnected supplies; "spot" gas purchases; projected increases in takes; commitments for additional drilling in established fields; and consolidaton of fields for supply computation, to name some.

Industry sources in Washington are inclined to think that such a combination of considerations might have impelled the restudy, aside from the matter of volumetric calculation.

And the staff says the circumstances are not unusual.

But the fact remains that the same staff and the same commission that had appeared to evaluate Transco's reserves as adequate once, now question the figures.

**A switch to the flow-test or pressure-decline method for computing reserves could present some monumental problems.**

The problem would not be so acute in established fields.

Normally, pressure-decline data would be available and reliable. In water-drive fields, however, it would not necessarily mean a thing. In such fields, the pressure would tend to remain relatively high despite substantial withdrawals of gas.

And in many fields it cannot be definitely determined whether water drive exists until the field approaches depletion.

The flow-test method could be applied, of course, where well connections exist and the wells are being produced.

But what would the pipeline company or the producer do in a new field—one in which only a few wells have been completed, perhaps only one or two wells?

**Considerable gas must be produced before any pressure-decline data is possible if that method of reserve calculation is to be used.**

Flow-testing likewise would seem to be an impossible requirement. Most producing states frown on venting or flaring of natural gas. A reserves estimate is a necessary prerequisite for a pipeline connection, yet a connection is a prerequisite for production. So how do you flow-test?

Unless, of course, ordinary well-potential tests would serve the purpose—a rather doubtful procedure from a reserves estimate standpoint.

**Perhaps the most complex problem that would face pipeline companies and producers is the matter of potential, but unproduced, pay horizons.**

During drilling, operators customarily test potential zones indicated by previous subsurface geological findings, logging, etc., but do not necessarily make completions in all zones.

For example, there may be a dozen or more potential pay zones in a single well in South Louisiana. The usual technique is to complete in one or two of them, produce to depletion, then squeeze off that area and complete in another. Or the operator may drill additional wells to others of the indicated producing zones.

However, if a discovery well cuts several potential pays during drilling, and the tests are sufficiently good, it is customary to include these zones in the over-all calculation of the reservoir's reserves.

If each of these must be flow-tested, however, in order to satisfy some new criterion on reserves estimation, the operator would have to drill sufficient additional wells to effect completions in all zones, and would have to slow-test and establish productive capabilities from all of them.

That would be a very lengthy and expensive procedure. And it could be a hazardous one in such high-pressure areas as South Louisiana.

## More Canadian Oil

**U. S. imports of Canadian crude, exempt from mandatory controls, is scheduled to increase by late this year or in early 1961.**

The increase will be the result of an exchange agreement, reportedly involving 15,000 b/d, by a Toledo (Ohio) refiner and a Canadian company.

Present total imports of Canadian crude into the U. S. average approximately 113,000 b/d, of which 60,000 b/d is imported into District II—Ohio, Michigan, and the Upper Midwest—and the remainder into the Puget Sound area.

# Fast Area Price Decisions Sought

**The Federal Power Commission is receiving a steady flow of producer requests for quick action on gas sales which meet the area-pricing criteria.**

Within days after the commission made its area price pronouncement, independent producers put their lawyers to work in hopes of early settlement of pending cases, many of which have gathered regulatory dust for years.

By this week the applications threatened to reach the flood stage as an increasing volume of mail from the producer country reached FPC desks.

**One company — Southwest Gas Producing Co.—even offered to cut its proposed price by 1¢ per Mcf. in exchange for quick FPC approval of a new rate schedule.**

Southwest Gas earlier had asked 15¢ per Mcf., plus state tax, for gas sold from Louisiana's Monroe field to Texas Gas Transmission Co.

Southwest offered to settle its proceeding and accept 14¢—the top price for rate increases on northern Louisiana gas at 15.025 psia. under the new FPC policy.

But the company said the settlement offer would have to be accepted by the commission before Oct. 30, in order to allow quick effect of a new contract with Texas Gas.

**Shell Oil Co. case—in the midst of hearings—is being revised as a result of the area price guides.**

Examiner William J. Costello canceled what was to have been cross-examination of Shell witnesses at a hearing this week and, instead, brought the parties together to study the impact of the new price policy.

**Humble, Texaco, Pan American Petroleum, and other producers are asking FPC to cancel refund requirements in cases where rate increases are below the new area levels.**

Humble cited three contracts increased from 10.9¢ to 13.8¢ per Mcf. in Texas Railroad Districts 1 and 2, where FPC set a 14¢ maximum for increased rates on contracts now in existence.

Amerada Petroleum Corp. is seeking a conference with all FPC commissioners on Nov. 1 to weigh the effect of the area price policy on the company's pending rate case.

**Tennessee Gas Transmission Co. is citing area prices in an effort to get quick delivery of gas from Texas fields.**

TGT went to bat for its intended supplier, Valley Gas Transmission, Inc., and asked FPC to certify Valley's plans to buy and gather gas in Texas Railroad Districts 3 and 4. The company has contracted with 12 producers to buy gas at 17¢ and 16.2¢ per Mcf. in those Districts, where an 18¢ maximum on new sales was set by FPC.

# Soviet Team Opens U.S. Oil Tour

**Russia's oil team spent its first full week in this country in the Gulf area —first leg of a month-long inspection tour that'll span oil areas from coast to coast.**

The Soviet delegation—here on a reciprocal visit sponsored by the State Dept.—arrived late last week, one man short of the planned group of ten. A briefing at American Petroleum Institute headquarters (picture) preceded weekend visits to Tidewater Oil Co.'s Delaware City (Del.) refinery, and to Washington.

Only six of the visitors were on hand when the briefing got under way. Chairman of the delegation is Sepan Ivanovich Kuyvkin (far right), of Baskir Sovnarkhoz. In the foreground are State Dept. Officials and interpreters, as API President Frank M. Porter welcomed the group.

# Humble's Aim: To Be Humble

**Humble Oil & Refining Co. apparently is concentrating for the time being on putting across the name "Humble" in just about all of its marketing areas.**

The company name is now going up on all of Humble's 30,000-plus service stations.

It is also retaining the individual brand names of its various marketing divisions within their established territories—Esso in the East, Carter in the Mid-Continent, Oklahoma and Pate in the mid-U.S., and Humble in the Southwest.

One exception is the use of ENCO as a brand name in part of the Carter division's territory. In parts of Washington, Oregon, Idaho, and Montana, Humble is conducting a market test of the ENCO label. ENCO is the contraction of Humble's slogan—"the nation's leading energy company."

**There is no certainty at the moment that Humble will change to ENCO as a national brand name, despite frequent reports to the contrary.**

"A great many people have had us making decisions that we haven't made," said one company official.

It was explained that it would not make sense to engage in a market test of a brand if a decision to use it had already been made.

While ENCO may eventually be used if, and when, the company decides upon a single brand, Humble is considering other brand names.

At the time that the several subsidiaries of Standard Oil Co. (N.J.) were merged into Humble Oil & Refining, the company said it would market nationally as Humble Oil & Refining—a fact frequently overlooked in the speculation of a new "image."

# Justice Dept. Voices Merger Views

**The Justice Dept. was kept "fully informed" on the plans of Humble Oil & Refining Co. to acquire Monterey Oil Co., according to Robert A. Bicks, the federal antitrust boss.**

In response to questions by PETROLEUM WEEK, Bicks said that, while the two parties submitted data on the planned acquisition, they "did not ask for prior clearance" from the Justice Dept.'s antitrust division before announcing the purchase.

The two companies reported last week that Humble would purchase "substantially all" of Monterey's business and assets (PW—Oct.14'60,p10).

The major asset not included in the purchase is Monterey's interest in Transwestern Pipeline Co., which Monterey's president, Howard C. Pyle, said was valued at $13-million.

Based on the estimated distribution to Monterey's shareholders upon dissolution of the company of $42 a share, Humble will pay a net of approximately $69-million for Monterey's shareholders upon dissolution of the company of $42 a share, Humble will pay a net of approximately $69-million for Monterey's oil and gas producing properties in six states.

**Bicks indicated that if the Justice Dept.'s antitrust division planned to oppose Humble's acquisition it would move quickly, preferably before the deal is consummated.**

Defending the Justice Dept.'s announcements of intention to oppose a planned acquisition of one company by another, or a merger of two or more firms, Bicks said that such actions by his division benefited both the government and the affected parties.

The considerations are, he told the New York Society of Security Analysts last week, that an unconsummated transaction can be more easily halted, without the necessity of formulating an eventual plan of divesture, and that "considerations of basic fairness suggest that, where feasible, business concerns be informed of intent to sue before business commitments are ultimately finalized."

**Competition—or rather the reduction in competition—is the key guide of the antitrust division in opposing mergers and acquisitions.**

Bicks said that the intent of Congress in amending Section 7 of the Clayton Act was to "proscribe any acquisition that may substantially lessen competition or tend to create a monopoly."

Vigorous enforcement of Section 7 in "those sectors with great growth potential can avoid loss of competitive vigor via undue concentration," he commented.

Robert A. Bicks

**Absolute size of companies involved in acquisitions is "absolutely irrelevant," Bicks said.**

But the size of the reduction in competition following an acquisition is "most relevant," he observed.

"In a sealed-off market—such as California (in case of oil acquisitions)—size would thus become relevant, and requires a case-by-case study," Bicks explained.

**Bicks said that if a proposed acquisition does reduce competition in an area, one factor that is considered is "ease of entry" of newcomers into that market.**

He cited as extreme examples the ease of entry in a retail market—such as a grocery store—as opposed to the difficulty of entry of a new steel producer.

Questioned about the ease of entry in petroleum markets, Bicks replied: "Is entry really difficult, in the light of access by small refiners or marketers to oil import licenses for which they have no ready use?"

**There are no petroleum acquisitions that can be described as "safe" if they involve a substantial reduction in competition, regardless of whether producing, processing, or marketing properties are involved.**

Any consolidation where the transaction is in excess of $3-million and not subject to specific authorization by another federal agency is guaranteed to get the attention of both the Federal Trade Commission and the Justice Dept.

Bicks spelled out the antitrust philosophy as it pertains to oil by citing the reasoning behind actions by the antitrust division that halted two recent acquisitions.

In the proposal of Texaco Inc. to acquire Superior Oil Co. of California late last year, Bicks said that the opposition was based on the ground that the two companies competed in production in all principal areas of the U.S.—"not only in crude but also in LPG and natural gas."

Texaco at the time, Bicks said, "ranked No. 1 in domestic production and reserves, and Superior was the largest independent, ranking 19 or 20."

In the case of the proposed acquisition of Leonard Oil Refineries, Inc., by Standard Oil Co. (Ohio), Bicks said the reason the antitrusters opposed it was that, by acquiring Leonard, Sohio would have been in a position to cut off the refined products supply of the "No. 2 and No. 3 independents in the Michigan market."

## Halliburton Set for Electronic Growth

**Halliburton Co. is planning a program for major expansion in the electronics field.**

The first step in the plan is the transfer of control of Welex Electronics Corp. from Halliburton's subsidiary, Welex, Inc., directly to the parent company, according to an announcement by Logan D. Campbell, chairman, and L. B. Meaders, president, of Halliburton.

Welex Electronics was created as a subsidiary of Welex last year.

Halliburton acquired Welex Electronics in 1957.

**The expanded electronics program will be directed by W. J. Greer,** as chairman and chief executive officer of Welex Electronics. Greer, formerly vice-president and director of research and engineering for Welex, also has been named a vice-president of Halliburton.

Greer will direct Welex Electronics from its Washington headquarters, where a second manufacturing plant is nearing completion. The electronics research laboratory will continue to be located in Houston.

Other officers of Welex Electronics are: E. J. Powers, president, E. B. Wilson and W. I. Coquillette, vice-presidents, and Donald de Laski, secretary-treasurer.

"...pacing the pipeline construction industry
for more than a quarter century"

price tower

PIPELINE
H·C·PRICE·CO
CONSTRUCTORS

bartlesville, oklahoma
cable address: HCPCO

# The Issue: World Oil Price Dictation

**BEIRUT**—If there was any doubt left, this week's sessions of the second Arab Petroleum Congress dispelled it: What's really at issue here is not "international proration," nor even price stabilization, but something approaching worldwide price dictation and complete managerial control of the oil industry.

This conclusion may not be representative of all the myriad of delegates attending the Congress, but it is of at least the goodly bulk of them. And judging from the official speeches, statements, and backroom elaborations, it is clearly the intent of the two men who are unquestionably the guiding spirits of this Congress: Saudi Arabia's fiery Director of Petroleum Affairs, Abdullah Tariki, and Venezuela's mild-mannered but equally crusading Minister of Mines & Hydrocarbons, Juan Perez Alfonzo.

Both are still considerably and understandably flushed with success with the recent Baghdad meeting of five key oil exporting countries, out of which has emerged the Organization of Petroleum Exporting Countries (OPEC), and are working together hand-in-glove like a well-oiled precision team.

* * * *

The initial idea for so-called international proration—or, more correctly, production and export controls—was first outlined by Perez nearly two years ago in his early pronouncements when he first came to power, then elaborated and pushed informally during his visit to the first Arab Oil Congress, in Cairo last year.

Then the plan was picked up and formalized by Tariki in a speech at Tyler, Tex., last spring, and, more recently, adopted for study by the recently formed OPEC.

What might be termed the second phase is now unfolding: promotion of a price-formula scheme, the ultimate effects of which, as it is now outlined, would result in not only substantially higher oil prices but in a rough division of markets between Venezuela and the Middle East on a broadly hemispheric basis—with Venezuela getting the Western Hemisphere and the Middle East confining its sales to the Eastern Hemisphere.

The essential nub of this pricing formula was outlined by Perez in statements he made Sept. 26 and 27 in London. But it was left to Tariki, again, to formalize and elaborate it in his major paper to the Congress here this week—entitled "The Pricing of Crude Oil and Refined Products."

And if Tariki intended to startle the oil world, he can safely be said to have succeeded.

* * * *

Apart from a few quick proposals for complete reorganization of the international oil industry structure, the major part of his paper was devoted to an elaborate presentation purporting to prove that oil companies, since 1949, have been computing the posted price of Middle East Oil in such a way as to make its delivered price in New York equal to the delivered price in New York of Venezuelan oil (a far-from-accurate assumption).

Instead, he declared, Middle East posted prices should be equalized with Venezuelan oil at London, not New York, and equalized, moreover, with the higher-priced United States Gulf postings, not Venezuelan postings. Tariki's formula: The Middle East posted price should be equal to the United States Gulf price plus actual transportation from the Gulf to London, minus actual transportation from the Middle East.

By his own figures, this would mean that Middle East crude prices should be raised 58¢ a bbl. (actually 68¢ to allow for the recent 10¢ Middle East price cut).

Tariki insisted that Middle East and Venezuelan oils should be made "competitive at London because this represents the center of the major market for Middle East oil" (but made no reference to the fact that London is, however, no longer a major market for Venezuelan oil).

He dismissed competition in the Western Hemisphere as insignificant because only 8% of Middle East production goes to the United States while 55% goes to Western Europe.

The reaction of oil industry delegates here can best be described as dazed. As one oil man who has been specializing in marketing for 20 years put it, "This is the most fantastic formula approach to oil pricing I have ever heard—a theoretical and unreal superstructure built on an erroneous base."

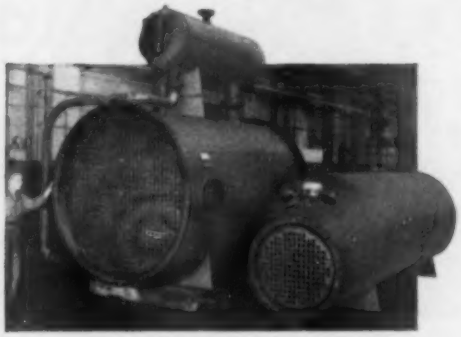
* * * *

Discussions with other delegates made it clear that the Tariki-Perez formula of equalizing Middle East and Venezuelan prices at London raised more questions than it answered. For instance:

- Adoption of this formula would mean that

**continued ▶**

**1** A nitric acid plant installed this unit. It has a built-in platinum catalyst chamber.



**2** A methanol plant operates these horizontal type units.

# 5 TYPES OF Waste Heat STEAM GENERATORS

Each of the units shown were custom designed to solve the specific problems peculiar to individual plant processes.

Vogt engineers are available to help you develop the right equipment to efficiently provide low cost steam from process heat. There's no obligation.

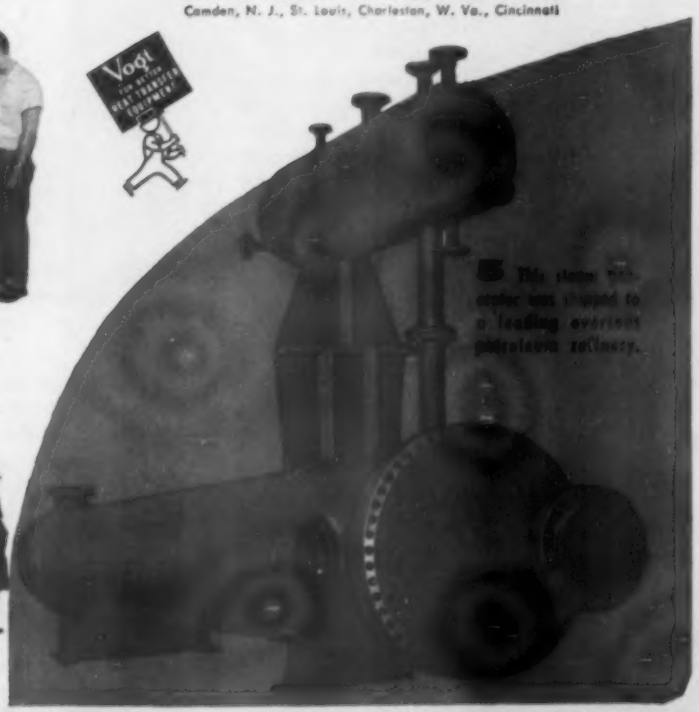
*Write for Literature — Address Dept. 24A-XPW*

**HENRY VOGT MACHINE COMPANY**
**LOUISVILLE, KENTUCKY**

SALES OFFICES: New York, Chicago, Cleveland, Dallas, Camden, N. J., St. Louis, Charleston, W. Va., Cincinnati

**3** Horizontal unit for a nitric acid plant.

**4** Vertical type unit for a hydrogen plant.




**5** This steam generator unit is shipped to a leading overseas petroleum refinery.

# Vogt HEAT TRANSFER EQUIPMENT

Middle East oil would have to give up all its markets in the Western Hemisphere. While shipments to the United States are currently limited by import quotas, Middle East sales to South America and other parts of the Western Hemisphere have been growing steadily. Last year they averaged over a half-million barrels daily, or some 13% of total Middle East production. This was equal to more than half of Iraq's total production.

Loss of these 500,000 b/d outlets, at today's rate of payments to Middle East governments, alone would mean loss of some $150-million current annual revenues to the governments.

While Tariki explains he's perfectly ready to give up the Middle East's markets in the Western Hemisphere, and to confine sales only to the Eastern Hemisphere, will the Middle East governments, on reflection, be ready to share this generosity?

• Venezuela has already lost its former markets in the Eastern Hemisphere, and is on the road to losing more and more markets in the Western Hemisphere to Middle East oil. What it would gain from this price formula is obvious. But if the Middle East is to give up its markets in the Western Hemisphere to Venezuela, what is Venezuela giving up in return?

• An unstated implication in this price thesis is that the international oil companies operate in both Venezuela and the Middle East, so that division of markets between these two sources would be equally "equitable" for the producing companies. However, except for Shell and Jersey Standard, the other large producing companies in the Middle East—British Petroleum, Gulf, Texaco, Socal, and Mobil—either have no Venezuelan production or only nominal amounts. How could these companies be expected to go along with a pricing scheme which would eliminate their Middle East production from all the Western Hemisphere markets they have developed?

• The implication of the Tariki thesis, of course, is that the Middle East would more than make up its losses in the Western Hemisphere by the higher prices it would get in Europe. But this may prove to be quite ethereal at best. If Europe is held to ransom at such high prices for its Middle East oil, it can be safely assumed that these consuming nations will start switching to other sources of energy supply as quickly as possible.

In other words, such a Mideast price formula would form a perfect price umbrella for substantial losses of fuel oil markets back to coal (fuel oil represents some 40% of Europe's oil consumption); for speeding already-developed plans for piping large quantities of French Sahara gas to Europe; and, of course, for a quick stepup of shipments of Algerian and Libyan crude to Europe—not to mention Russian oil.

Tariki's paper, however, makes no provision for such market losses in the Eastern Hemisphere, apparently assuming that, because Europe's consumption of Middle East oil has been rising by leaps and bounds, it will continue to do so regardless of the terms.

* * * *

To top things off, he concluded his paper with two sweeping proposals for reorganization of the international oil industry:

(1) That the international oil companies divest themselves of ownership of Middle East producing affiliates. This, he said, "can be accomplished by selling the shares, or interest, in a producing company to the stockholders of the parent companies. Thus, the producing companies will be independent and can better direct operations to conform with the best interests of the host country and of its stockholders."

(2) That the newly divested producing companies then establish marketing facilities "in those countries not supplied by the parent companies."

To "avoid any disturbance in present market conditions," Tariki would allow these divested producing companies to sell oil to their former parent companies on a long-term-contract basis. "The producing companies, within their new capacity," he continued, "shall endeavour to establish petroleum facilities in various countries where a clash of interests will not occur with parent companies, thus avoiding unfavorable competition which might lead to an anticipated loss for both the governments and the oil producing companies. Oil producing companies hence shall limit their activities for the time being in those countries not supplied by the parent companies."

Tariki gave no further elaboration—nor any clue to where he thinks such newly divested producing companies could find markets without competing for them with their parent companies.

Oil men here were at a loss to think of any such areas outside of Red China or other Soviet satellites—with the possible exception of Easter Island.

* * * *

In private conversation, Tariki was asked what he meant by a recent remark of his that oil companies had only another five years left in the Middle East.

He explained that that was all they could survive unless they changed their policies to conform to these ideas.

"And if we conformed," said one oil man, "we wouldn't last out the year."

At any rate, one thing seems abundantly clear: The basic programs being pushed by Tariki—with substantial backing from Perez—may be called "international proration and price stabilization," but what is meant by these terms is a far cry from what these terms mean when used by the Texas Railroad Commission.

Abdullah Tariki clearly is no General Thompson.

# A NEW line of unit pumpers to cut your pumping costs

## Continental-Emsco's API UNIT PUMPER LINE

ENGINEERED EVEN BETTER . . NOT JUST BUILT

## Designed to conform with recent API proposed standards

**After exhaustive tests, field pumping is a breeze for C-E units. So thorough are these tests that every possible well condition is duplicated . . every critical stress area checked with modern electrical strain gauges. Performance tests prove C-E's engineering reputation . . Engineered EVEN BETTER . . not just built.**

### Here's what these new features mean to you

**HIGHER SAMSON POSTS** . . increase operating efficiency through improved geometric design . . permit more efficient well counter-balancing. A maximum 1.06 torque factor has been attained by this design for all units.

**MORE FLEXIBILITY** . . 18 different units make it possible to apply the right unit to any well load for lower initial and operating costs . . a wide variety of stroke lengths is available for all pumping requirements . . any type of prime mover can be used to take advantage of gas or electricity, whichever is lower in cost.

**IMPROVED LUBRICATION FOR GEAR REDUCER** . . cast oil troughs distribute oil better, more thoroughly . . time-proven C-E features have been retained.

**NEW WRIST PIN AND PITMAN CONNECTION** . . Permits faster field assembly and speeds up changing stroke length. Pitman attaches to wrist pin bearing housing with through bolts. Tightening the bolts brings the parts together accurately and simply.

**NEW BEARING ASSEMBLIES** . . Pre-lubricated and sealed structural bearings eliminate contamination from field greasing (an optional feature). All bearing applications are based on manufacturer's B-10 life ratings.

**QD SHEAVES, STANDARD** . . available anywhere, these sheaves are lower in price than special sheaves.

**STRUCTURAL CAPACITIES** . . from 5,300 lbs. to 29,000 lbs. in 18 sizes. A unit pumper size for every well.

*For Service that Sings . . Equipment that Hums . . Go . .*

**CONTINENTAL-EMSCO**

*Serving the Oil and Gas Industries . . . Worldwide*



PT-962

CONTINENTAL EMSCO COMPANY • A Division of The Youngstown Sheet and Tube Company • General Offices: Dallas, Texas
Export Division: 30 Rockefeller Plaza, New York, N. Y. • Continental-Emsco Company Limited • General Offices: Calgary, Alberta, Canada
Continental-Emsco Company C. A., Caracas, Venezuela • Plants: Houston and Garland, Texas; St. Albans, Herts., England
Representatives in All Principal Oil Fields of the World

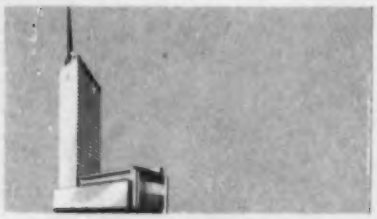
RHIA*

*
RANK HAS ITS ADVANTAGES

For decades, oil and gas men have turned to the Republic for the many varied and special bank services they require. Republic knows you must have accurate fact and figure data, prompt decisions on financing, and frequently, bank counselling with your lawyer on regulations and tax matters.

As a pioneer oil bank in the South . . . with the South's largest Oil and Gas Department, Republic is uniquely equipped by experience, knowledge and resources to give you the complete, specialized service you need.

Doing business with Republic Bank indeed has its advantages and they are in your favor. Next time, talk to Republic, indisputably a leader in the field of oil and gas financing. We're here to serve you.



REPUBLIC NATIONAL BANK OF DALLAS

CAPITAL AND SURPLUS
$102,000,000
LARGEST IN THE SOUTH
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION


# What's New / IN THE INDUSTRY

**Refineries will have to make a high percentage of middle distillates in the future,** according to Vice-Admiral B. B. Biggs, director of Petroleum Logistics Policy for the Defense Dept. Citing the squeeze on middle-distillate fuels as a problem for both industry and defense, Biggs told a petroleum seminar of the Quartermaster Assn. last week that the Defense Dept., in turn, must insist on equipment that can use fuels available in emergencies. He said refiners complain that services ask for two many fuels with too-tight specifications—"sliced with a razor blade." "I will do my best," he added, "to beat [the services] over the head to reduce the number of fuels they have to have."

•

**Oxygen and nitrogen will be supplied to industrial users along the Houston ship channel by an 8-mi. pipeline.** The line, to be operated by the Linde Co., division of United Carbide Corp., will supply the industrial gases from a plant to be built in the area. Initial customers have contracted for 460 tons daily of oxygen and 105 tons daily of nitrogen.

•

**Pacific Gas & Electric's market for gas is expected to outgrow present supplies from Alberta by 1965.** Charles P. Smith, vice-president of Alberta & Southern Gas, told the Canadian Assn. of Oilwell Drilling Contractors last week that PG&E's market for gas is growing at the rate of 100-million cf/d every year. By 1965, he said, the sendout will average more than 2-billion cf/d, compared with 1.5-billion cf/d today.

•

**Natural gas from Western Canada began flowing through Midwestern Gas Transmission's 559-mi., $52-million pipeline in the Upper Midwest.** The line originates near Emerson, Manitoba, at the Minnesota-Canada border, and extends southeast across Minnesota and into Wisconsin, terminating near Marshfield.

**Midwestern has also been authorized by the Federal Power Commission to sell up to 80-million cf/d of gas to American Louisiana Pipe Line** on an interruptible basis at 28.44¢ per Mcf. American Louisiana will take gas in Spencer County, Ind., and deliver it to its affiliates—Michigan Consolidated Gas and Michigan Wisconsin Pipe Line.

•

**Avondale Shipyards, Inc., says two refrigerated anhydrous ammonia barges it will build for Phillips Petroleum Co. are "the largest tank carriers yet to be constructed for this type of service."**

The barges will be 280 ft. by 44 ft., of the open-hopper design. Each barge has a capacity of 1,700 tons, refrigerated to minus 28F by equipment installed on the barge.

•

**Tidewater, Kerr-McGee, Skelly Oil, and Getty Oil have formed Petrotomics Co. to mine uranium in Wyoming.** Tidewater is the acting manager of the operation. The company plans to build an ore-processing mill in the Shirley Basin.

•

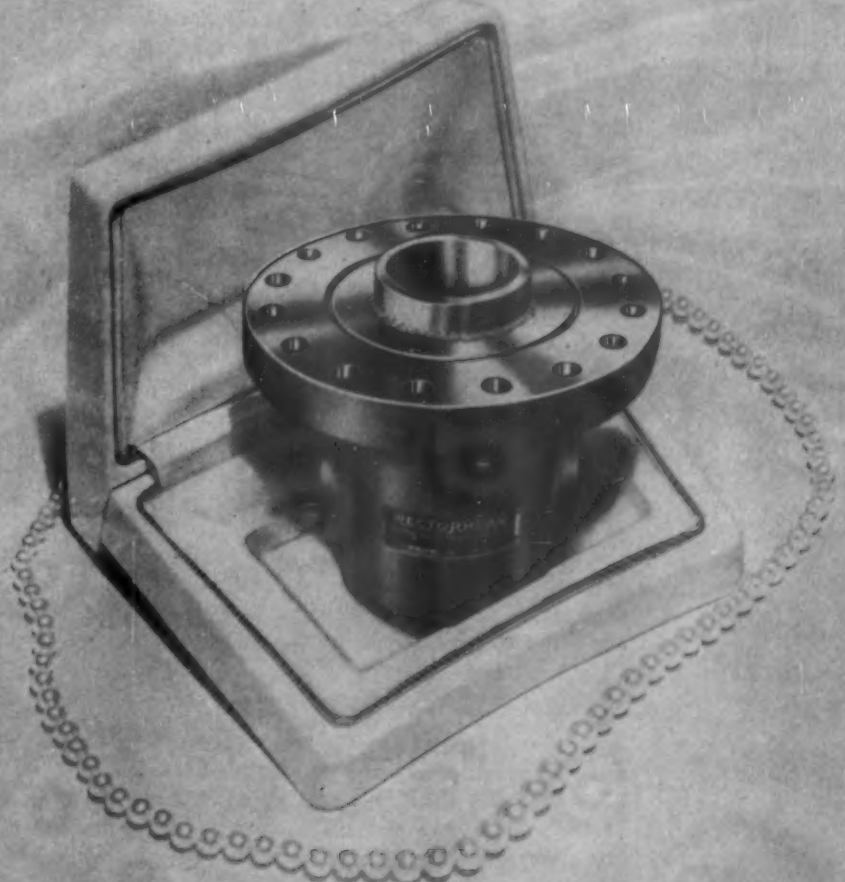
**A boost in New Mexico's November allowable is expected to increase the state's production by 5,200 b/d.** The Oil Conservation Commission upped southeastern New Mexico's unit allowable last week from 33 b/d to 34 b/d—the first increase in six months. The unit permissible in the northwest was left unchanged at 70 b/d.

# Rector

WELL EQUIPMENT CO., INC.

*Making the Oil Industry Safer!*

## 30th anniversary



*Rectorheads are Sealed with Steel*

# Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
October 21, 1960

**With the presidential election less than three weeks away, oil and gas depletion reaches new heights as a campaign issue.** The tax provision now has the questionable distinction of being a relatively narrow subject placed on a near-equal standing with issues of broad political and social impact. But elections have turned on less.

**The candidates' positions—at least during the campaign—are being made clear.** Vice-President Nixon wants to maintain the present depletion formula for oil and gas. He has made this point several times in recent months, and has not changed his ground. Sen. Kennedy says he wants to study the entire tax structure—including oil and gas depletion—to determine if inequities exist. If the industry's depletion rate is found too high, he would "vote to close that loophole."

•

**Both Sen. Kennedy and the Democratic Advisory Council have softened their positions on depletion.** Kennedy has voted in the Senate against a flat reduction in the oil and gas depletion percentage, but he has voted for a graduated cut.

Now the Democratic Advisory Council, official policy-recommending arm of the party's National Committee, says in a new statement: "The depletion allowance system for income taxes should be thoroughly reviewed. Reasonable adjustment should be made so that mineral as well as oil and gas producers will receive fair and equitable treatment."

•

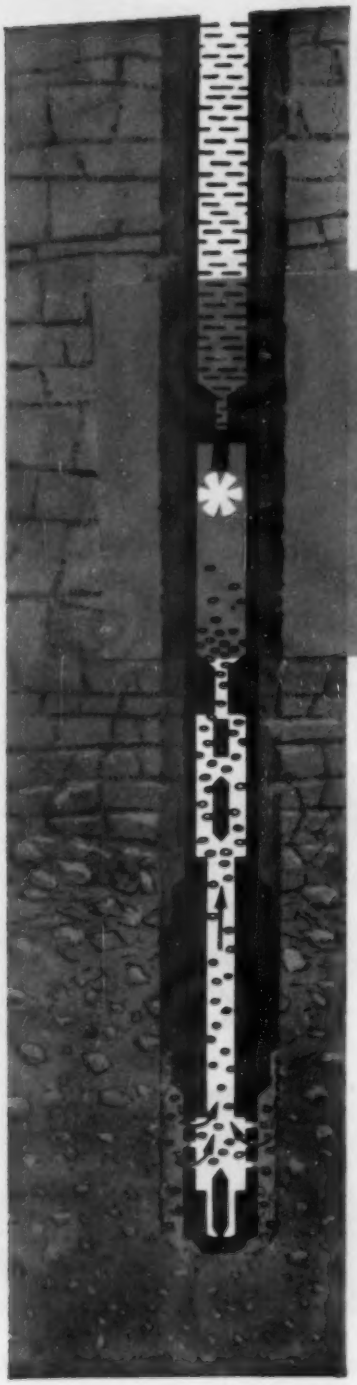
**The government's long-awaited, long-range study on oil supply and demand is nearing completion.** The study, ordered by the old Office of Defense Mobilization in 1957, will look at anticipated supply of oil and gas liquids through 1975 and compare the results with prospective demand for those products.

**The report presumably will be used to help formulate governmental policy decisions involving oil.** ODM's successor agency, the Office of Civil & Defense Mobilization, now hopes to have the study completed before the end of the year. A draft of the study has been submitted by the Interior Dept., which did the legwork on the report. Several consultants, including oil industry representatives, made recommendations, which now are being incorporated into the final version of the study.

•

**First reports are due from importers in February for a new government check on prices and deliveries of residual fuel oil.** The Office of Civil & Defense Mobilization, starting next year, will receive monthly reports from residual importers. The first report will be accompanied by data bringing OCDM up to date from 1957.

**This is official Washington's first overt move to watch residual prices.** President Eisenhower charged OCDM with this responsibility when the mandatory imports program was started, but the agency has never before gone directly to importers for first-hand information. One spur to the new requirement was the protest by New Englanders of last summer's price increase for residual.



# now! find low pressure payzones

## . . . Regardless of Water Cushion

When testing deep formations, the hydrostatic pressure of the water cushion used to keep the pipe from collapsing can often hide potential production in a *low pressure* zone.

**THE NEW HALLIBURTON RETRIEVABLE BACK PRESSURE VALVE** can help avoid passing up these payzones by supporting the water cushion so its hydrostatic head does not affect the formation pressure recordings. The Back Pressure Valve is retrievable by wire line.

### LOOK AT THESE RESULTS

On a recent West Texas test where the hydrostatic pressure of the water cushion used exceeded 900 psi, the use of the Back Pressure Valve allowed the operator to obtain the following formation pressure recordings from the zone tested:

| | |
|---|---|
| Initial flow pressure | 110 psi |
| Final flow pressure | 303 psi |
| Closed-in pressure | 566 psi |

Since all formation pressures were less than the hydrostatic pressure of the water cushion, it is obvious that, without the use of the New Halliburton Back Pressure Valve, no formation pressure would have been indicated and this potentially productive zone might have gone undetected.

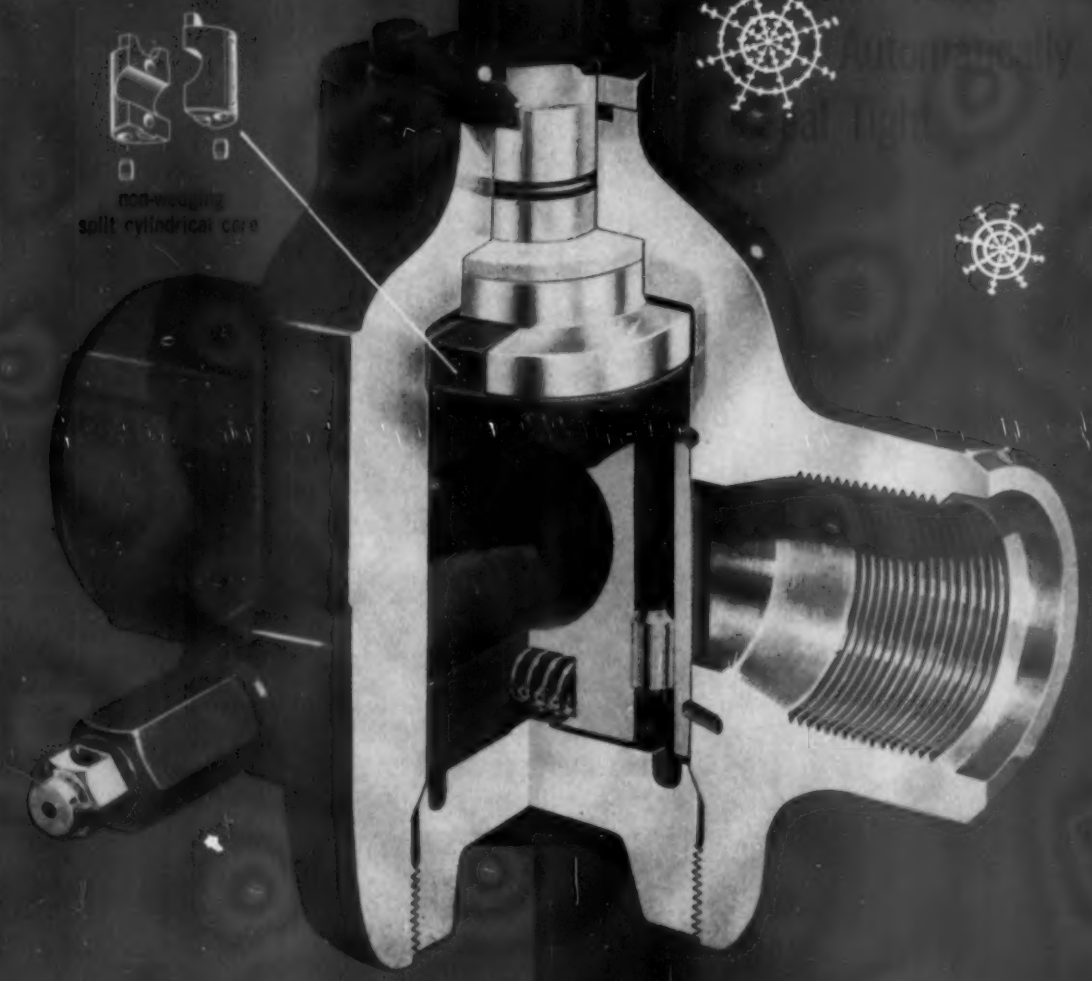
ASK YOUR HALLIBURTON TESTER ABOUT THIS NEW INNOVATION!

## TESTING SERVICES

*Another first in Formation Testing!*

**Halliburton**
COMPANY • DUNCAN, OKLAHOMA

# HOT or COLD




**No Thermal Distortion.** Here's why: A non-wedging, split cylindrical core seals without wedging. Only the downstream core half is pressed against the body by line pressure. It literally "floats" into position to compensate for thermal or physical distortion. The upstream core half is held lightly against the body only by spring pressure. The circular sealant groove is positioned at the heaviest section in the valve body thereby eliminating distortion and effecting a perfect seal in this critical area. Sealant is forced automatically—by line pressure itself—through two semi-circular grooves around the downstream port. Leaks are literally stopped before they begin.

Mission features a full hole, round opening valve with no restrictions, no turbulence. Regular round opening valves are also available. The wide selection of more than 315 valves to choose from, the Mission guarantee, and the Mission Valve Renewal Policy combine to make Mission your best and most economical buy.

**MISSION MANUFACTURING CO.** P. O. BOX 4209, HOUSTON, TEXAS CABLE ADDRESS "MISSCO"
EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK • In the United Kingdom: **MISSION MANUFACTURING CO., LTD.,** 1 Hanover Square, London W. 1 England • cable address "MISSOMAN"

MISSION MANUFACTURING CO.

ALUMINUM DRILLPIPE used in history-making deep field test by Shell Oil Co. in Southwest Texas is stacked during trip.

STEEL TOOL JOINTS developed by Reed Roller Bit Co. were attached to the aluminum pipe by special process.

# Aluminum Drillpipe Passes Field Test

**A full string of aluminum drillpipe has passed its first commercial field test.** W. G. Reynolds, executive vice-president of Reynolds Metals Co., and John Maher, president of Reed Roller Bit Co., made the announcement this week.

The aluminum pipe used in the test was developed and manufactured by Reynolds after six years of experimental work and private field tests.

The pipe was fitted with special tool joints engineered and made by Reed. The tool joints were developed by Reed's research department in cooperation with Reynolds' product-development division after several years of tests.

Reynolds hopes to have 10 to 15 more strings of aluminum drillpipe in oilfield drilling use within the next few years.

**Shell Oil Co. used the aluminum pipe on its Rig No. 25 to drill a 10,400-ft. hole in DeWitt County, Southwest Texas.**

The rig was originally designed for drilling to depths of 7,000 ft.

A 9,000-ft. string of aluminum pipe was used. Steel pipe was added to the bottom of the string to reach total depth.

Use of the aluminum pipe in this test showed that a driller can pull an aluminum drillstring off bottom in air from depths as great as 16,000 ft. without taxing his rig "one pound more than when he pulls up 10,000 ft. of steel drillpipe," according to Reynolds.

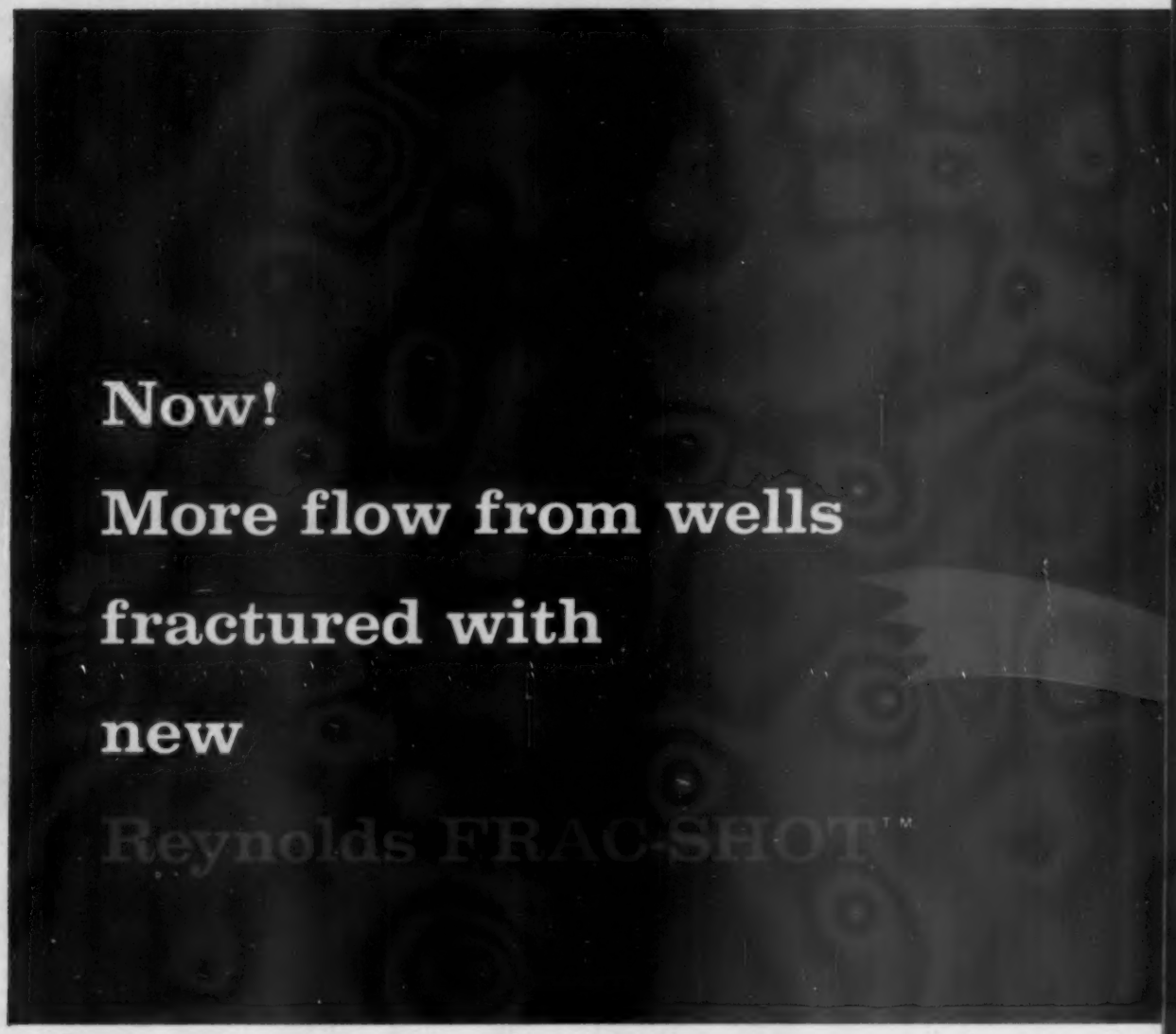
**Laboratory tests indicate that the aluminum drillpipe is at least equivalent to Grade E steel pipe,** Reynolds said.

The company reported that fatigue endurance of the aluminum drillstem and tool joint assembly has proved in lab tests to be 800,000 to 1.5-million cycles, compared with 500,000 to 800,000 cycles for Grade E steel pipe and tool joint assembly under the same loading conditions.

"Aluminum pipe weighs only about half as much as steel," Reynolds said, "and for this reason aluminum drillpipe will penetrate up to twice as deep as steel pipe before exceeding a rig's hook capacity.

"4½-in. aluminum pipe, in air, weighs only 8 lb. per ft., compared

RATHOLE CONNECTION is made by Shell drilling crew during 10,400-ft. test.




Now well fracturing can be more effective than ever before . . . making wells many times more productive!

A new propping agent, FRAC-SHOT, makes the difference.

FRAC-SHOT, a Reynolds Metals Company development, is aluminum "shot"—malleable pellets of aluminum. The process using aluminum shot has been developed by The Atlantic Refining Company, and patents are being issued.

Wells fractured with FRAC-SHOT in field tests have produced several times the flow of those fractured with conventional materials in the same fields. This increase is achieved because the conductivity of the fracture has been increased substantially. This is especially desirable where formation permeability is in the medium-high range. And this is where FRAC-SHOT pays its biggest dividends, according to results obtained by The Atlantic Refining Company.

The FRAC-SHOT aluminum pellets are strong and malleable; they will deform slightly under severe well conditions, but will not be crushed or pulverized. Thus, with FRAC-SHOT, the fracture is held open. Flow is not constricted as it is with other proppants. Although aluminum FRAC-SHOT is slightly higher in cost than conventional materials, it more than pays for itself in additional production.

FRAC-SHOT is another of the developments in aluminum by the pioneer and leading supplier of this metal for the petroleum industry—Reynolds.

New FRAC-SHOT aluminum pellets provide better support for fractures, increase well flow several times over ordinary fracturing methods.

You'll find many other Reynolds developments, and Reynolds Aluminum working in all phases of the industry, improving production, reducing costs: in lightweight drilling rigs, Oil Country Pipe, service lines, offshore drilling structures, tanks and vessels, and in a wide range of equipment.

FRAC-SHOT is available from any of the following major service companies:

B. J. Services, Inc.
Dowell Division of Dow Chemical Co.
Halliburton Company
The Western Company

Or, for information on FRAC-SHOT, or on any aluminum application for the petroleum industry, contact the people who know aluminum for petroleum—your local Reynolds office, or write *Reynolds Metals Company, P. O. Box 2346-EP, Richmond 18, Virginia.*

**REYNOLDS ALUMINUM**

Watch Reynolds new TV show
"Harrigan & Son", Fridays; also
"All Star Golf", Saturdays—ABC-TV.

with 15 lb. per ft. for steel, or a difference of 200 lb. per 30-ft. section."

This weight differential is even greater in drilling mud, he continued. For example, in 10-lb. mud, a joint of Range 2 aluminum pipe weighs 218 lb., compared with steel's 455 lb., he said.

**The steel tool joint used on the aluminum drillstem during the Shell test embodies the latest developments in Reed Roller Bit Co.'s "Inarclad-60" hard-metal process.**

Maher reported that Reed had also used a special process to facilitate the successful attachment of the steel tool joints to the aluminum pipe.

Reed and Reynolds made more than 60 full-scale laboratory fatigue tests on the tool-jointed aluminum drillpipe before attaining a satisfactory tool joint assembly.

When the drillpipe is worn out, bent, crushed, or damaged, Reed reported, there is no need to send the pipe to a shop. It is only necessary to buy new pipe and transfer the tool joints to it at the rig site.

The improved type Reed Super Shrink-Grip joints are applied and removed in the field by and with assistance of small portable heaters. The tool joint is heated to between 650F and 750F. Water is circulated in the aluminum drillpipe and the tool joint is then screwed onto the pipe. As the joint cools, the threads, shrink-grip area, and gaging shoulder shrink to a predetermined tightness. This tightness is held within the elastic limit of the pipe to prevent deformation.

**Use of the aluminum drillpipe is said to simplify handling both during use and during relocation.**

This is so, said Reynolds, because normally one-third to one-half less horsepower is needed to pull and run an aluminum string, resulting in reduced hoisting costs.

In fact, Reynolds added, the aluminum pipe is so light that two men can lift a 30-ft. section, whereas it would take four men to lift an equal length of steel pipe. He added that the aluminum pipe also will vary no more than ½ in. from a standard 30-ft. length, shoulder to shoulder on the tool joints, all on the plus side of 30 ft. This, he noted, should make tallying of drilling depth easier and possibly provide more accurate well logging.

The lightweight aluminum pipe also permits more footage of drillpipe to be carried per truckload when it is moved to a new location.

**Other advantages also are claimed.**

Reynolds said that hydraulics are better with aluminum pipe than with steel.

This is so, he said, because it takes less horsepower to pump mud through the extruded aluminum pipe because of its smooth bore.

"Aluminum's high scrap value offers still another advantage," Reynolds said. "At present scrap market prices, a return of approximately $1.75 per ft. can be realized after a piece of aluminum drillpipe becomes unusable."

The aluminum drillpipe also is expected to be advantageous in whipstocking, he said. This is because aluminum pipe can be deflected to the same degree as steel pipe with less bending stress and, therefore, longer fatigue life.

There have been no signs of pitting or galvanic type corrosion in any of Reynold's tests of the aluminum pipe so far. The amount of wear from abrasion has been no worse than is normally encountered with steel pipe, Reynolds said.

Reynolds began testing aluminum drillpipe six years ago (PW—Jun.26 '59,p23) with 500 ft. of 4½-in. pipe in 20-ft. lengths with steel joints. The 500-ft. test string accumulated 60,000 ft. of drilling in these tests before being "laid down" for study.

**...In difficult areas**

On the surface, tellurometers accurate to within inches over a fifty-mile traverse are visible indicators of GSI's new look at refraction shooting.

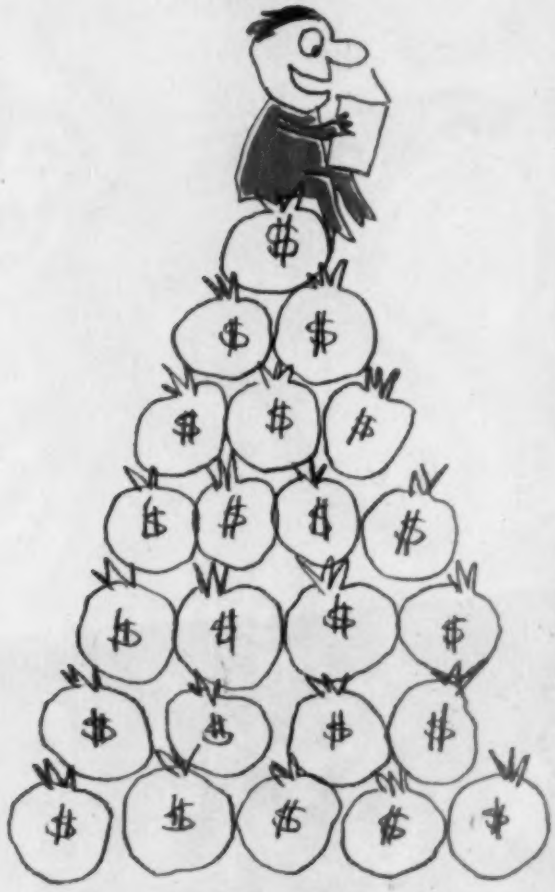
Looking deeper, recently developed refraction interpretation techniques, special refraction instruments and seismometers are giving GSI clients subsurface data in areas where it was unobtainable in the past.

If you have prospects which refuse to yield deep data through the use of reflection shooting our new look at refraction will interest you.

*For additional details, write....*

GEOPHYSICAL SERVICE INC.
900 EXCHANGE BANK BLDG. • DALLAS 35, TEXAS
A TEXAS INSTRUMENTS COMPANY

# Men who read more ...earn more!



Most of us recall at least one classmate who "never cracked a book", but somehow got by. Wonder where he is today?

Because today, in business and industry, "just getting by" isn't good enough. Sooner or later it spells defeat.

Men who "do crack a book", regularly and well . . . and particularly the McGraw-Hill specialized publication that is edited selfishly for them . . . do their jobs better, get ahead faster.

Just recently, for example, a fascinating study in another field showed that the men who invested five hours a week in reading business magazines earned an average of 75 percent more than those men who spent only an hour in reading. It makes sense in your business, too . . . doesn't it?

**Men who read more . . . earn more!**

Don't take our word for it —try a new RIGID Flaring Tool! See if you don't get smoother, stronger, more uniform flares . . . in less time and with less effort than ever before!

Then, compare this new RIGID Flaring Tool, feature-by-feature, with any flaring tool you've ever seen or owned:

• Feed releases automatically when flare is fully formed. • Reversing feed screw burnishes flare. • Hardened steel die bars are precision-machined. • Large, comfort-grip feed screw handle turns easily. • Precision-ground, hardened steel flaring cone, eccentrically mounted in precision bearings, produces rolling action for even metal flow . . . gives uniform flare walls without galling. • Tubing hole sizes are clearly marked. • Easy sliding rugged malleable yoke serves as stop for tubing to give correct flare size. • Yoke clamp screw fits into centering hole . . . locks bars, yoke and tubing into perfect alignment. • Stop pins keep yoke on die bars at all times . . . yoke can't slide off.

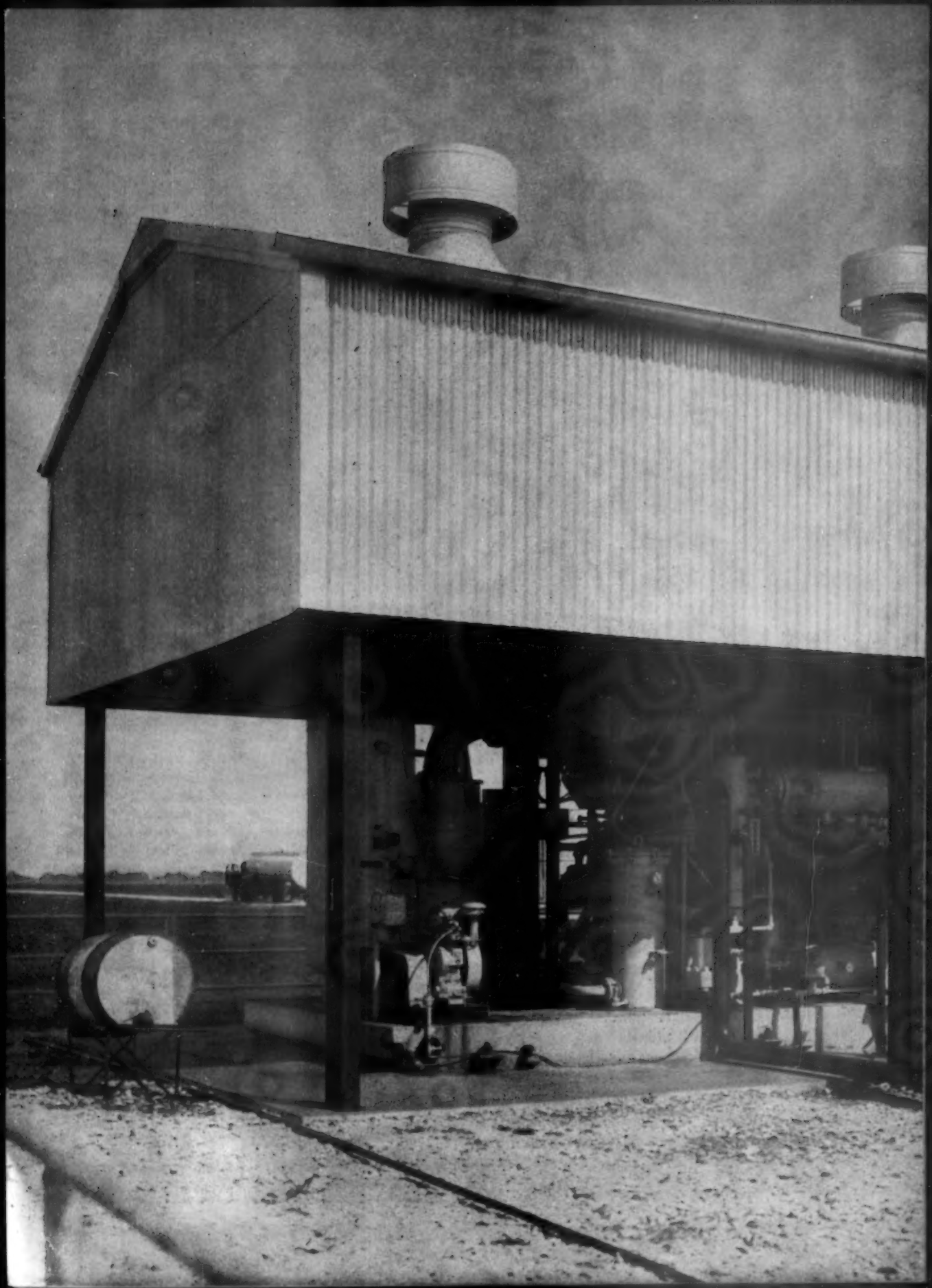
**3 MODELS:**

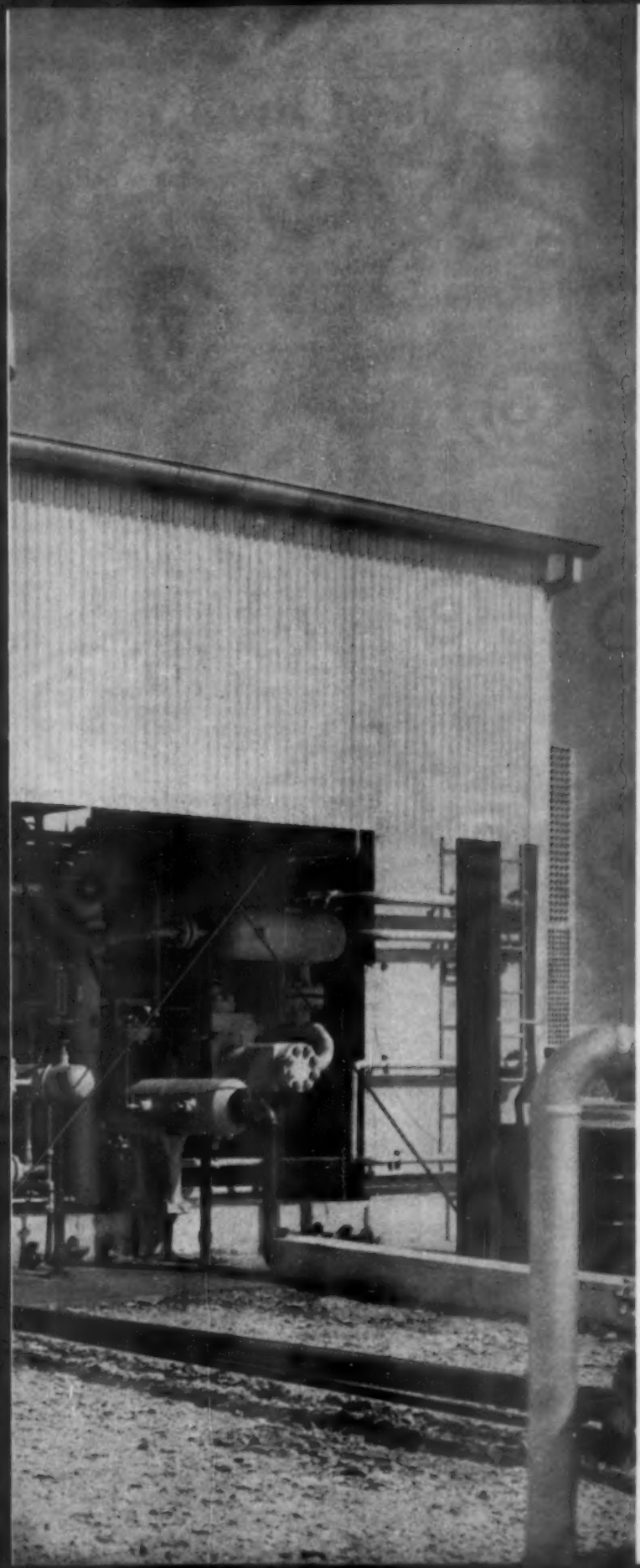
RIGID No. 457 for 45° flares, ⅛" to ⅝" O.D. (7 sizes)
RIGID No. 459 for 45° flares, ⅛" to ¾" O.D. (9 sizes)
RIGID No. 376 for 37° flares, ⅜" to ⅝" O.D. (6 sizes)

See and try these new RIGID Flaring Tools. Your Supply House has them.

RIGID

The Ridge Tool Company • Elyria, Ohio, U.S.A.





Max Powell, Chief Engineer of Russell Maguire.

# FACTS REVEALED ABOUT REMARKABLE ACCEPTANCE OF SLHC

Sales up . . . and up . . . and up. That's part of the history of Worthington's SLHC gas engine-compressor. What is the secret behind this remarkable acceptance?

Listen to Max Powell, Chief Engineer of Russell Maguire, talk about an SLHC on a cycling operation in the Faith-Mag Field, ". . . we wanted something that would run all the time—this does . . . we're pleased with it! Take last May, for example. We ran the SLHC unit 734 hours. That's 98.7% operation.

"Today this Worthington SLHC engine-compressor is handling almost 6 million cfd, taking suction at 750 psi and 1000 psi, and discharging at about 5000 psi.

"No, no one operates it. It's running unattended. Why do we like it? It's getting the job done . . . wish everything did."

When asked about maintenance costs, Mr. Powell didn't know. They were negligible—hadn't been high enough to keep separately on the books.

Mr. Powell didn't mention fuel economy, as some users do. Of all "under 1,000 hp" engine-compressors on the market, the Worthington SLHC is the only one specifically designed for turbo-charging . . . and so operates on up to 21 percent less fuel.

If you want fuel economy and dependability in the same unit, there's ample reason to buy the SLHC engine-compressor. Call your Worthington representative, or write Worthington Corporation, Section 43-17, Harrison, New Jersey.

Worthington SLHC gas engine-compressor packaged by A. M. Lockett Co. and operated by Russell Maguire at a United Gas Cap Cycling Project, Faith-Mag (9500' Frio) Field, Matagorda County, Texas.

WORTHINGTON

# How to Frac for Better Flood Recovery

## A survey in northeastern Oklahoma points out some key factors in boosting waterflood production through fracturing.

**A two-year study shows that fracturing both existing wells and new completions is greatly boosting oil recovery from waterflood projects in northeastern Oklahoma.**

This conclusion was drawn from a survey just completed by the Bureau of Mines Petroleum Research Center, Bartlesville, Okla., and the Independent Petroleum Assn. of America.

The study was initiated by IPAA in October, 1958, with the BOM quickly joining. The field work was done by John P. Powell and Kenneth H. Johnston of the Research Center. (Powell has since gone into private business.)

This first report is confined to operator practice in northeastern Oklahoma.

The study covered 17 formations in various pools in this part of the state. Subsequent reports will deal with fracturing practices and results on waterflood acreage in the Tri-State area of Illinois, Indiana, and Kentucky, and in the West Texas-New Mexico region.

**Timing, the study reveals, is of major importance when applying hydraulic fracturing to waterflood properties.**

For input wells, the formula is fairly simple: The formation should be broken down (fractured) when a well fails to take water initially, or when injection rates necessary for economical recovery can't be maintained.

For producing wells, the answer is more complex.

Some companies, the study found, have been successful in fracturing wells when total produced fluid is less than 50% of the proportionate volume entering surrounding input wells.

In oil wells that have been completed from open hole and shot, best results have been obtained from wells that were fractured when the water-to-oil ratio approached 10:1.

The study further shows that wells drilled several months after the initiation of flooding, and fractured soon after completion, have exhibited high initial production followed by sharp declines.

This, Powell and Johnston report, is caused by "the release of the built-up reservoir pressure created by a delay in drilling." Also, they note, sharp production declines may result from chemical deposits that plug the pay face.

**Premature fracturing of producing wells in waterflood projects may result in bypassing and trapping of large volumes of oil, the study shows.**

"In any waterflood, adequate time should be allowed for the reservoir to fill with liquid and respond to the water drive by forming an oil bank before fracture treatment is attempted," say Powell and Johnston.

On the other hand, fracturing can be delayed too long.

This, they add, may result in extension of artificial fractures into flow channels already created by water injection, and displacement of injected water into more permeable zones that have been depleted of oil.

**To illustrate the results made by fracturing at different stages in the waterflood, extensive data were gathered on two adjacent floods.**

Project A with 4,616 acre-feet and Project B with 3,040 acre-feet of floodable sand are situated in the same sand body (Bartlesville) and exhibit producing characteristics that are similar.

**Fracturing in the larger of the two floods—Project A—took place 18 months after a peak production rate of 17,200 bbl. of oil per month was established.**

The rate of production decline following fracture treatment has been approximately parallel to the estimated normal rate of decline—indicating the recovery of additional oil before flood recovery reaches its economic limit.

The Research Center determined this increase in ultimate recovery over normal waterflood production to be approximately 179,000 bbl.

**The smaller of the two—Project B—was fractured 36 months after a peak production rate of 30,300 bbl. per month had been attained.**

Again the decline following fracture was nearly parallel to the estimated normal decline, indicating an increase in ultimate recovery of approximately 55,000 bbl.

**Hypothetically, Project B would have yielded 63,000 more bbl. of oil had it been fractured 18 months sooner (chart, left).**

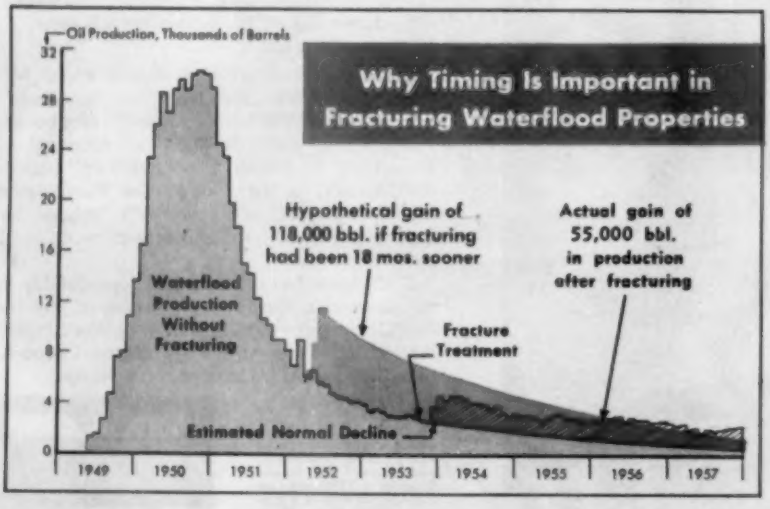
Reported Powell and Johnston:

"Assuming that the wells of Project B had been fractured 18 months after peak production, a hypothetical curve based on the production of Project A shows that an ultimate recovery of 118,000 bbl. might have been recovered from Project B."

They pointed out that the earlier and additional oil recovery would have hastened the payout for the project and could have been an important economic factor.

**No less important than timing, the study shows, is selection of the proper size of hydraulic treatment, fluid volume, and sand quantity.**

The study reveals that best results have been obtained in northeastern Oklahoma when engineering data and past experience were used



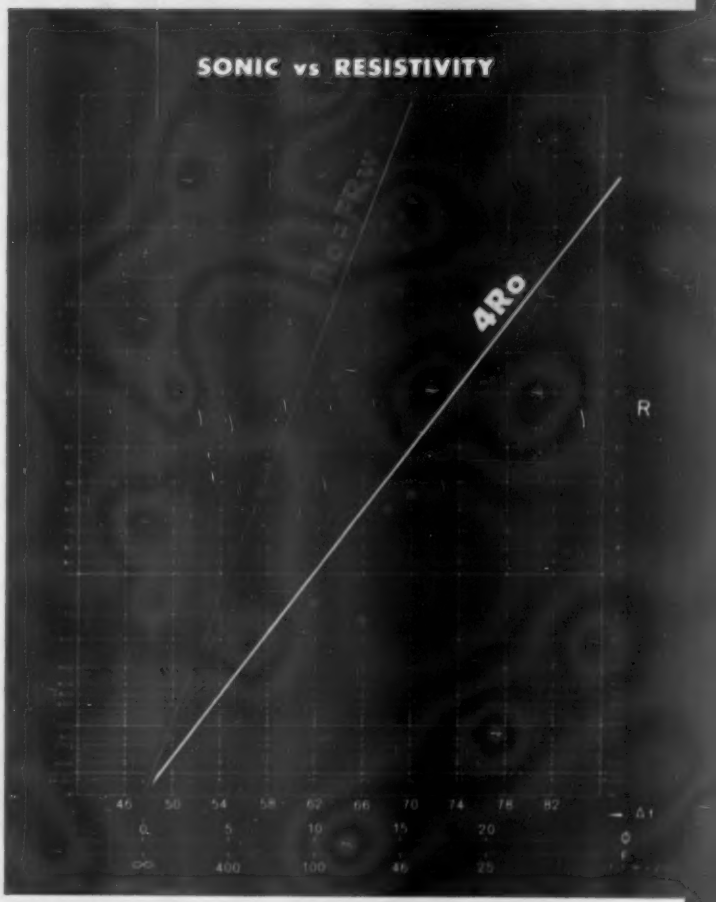
# Schlumberger Sonic and Resistivity Logs Simplify Oil Finding!

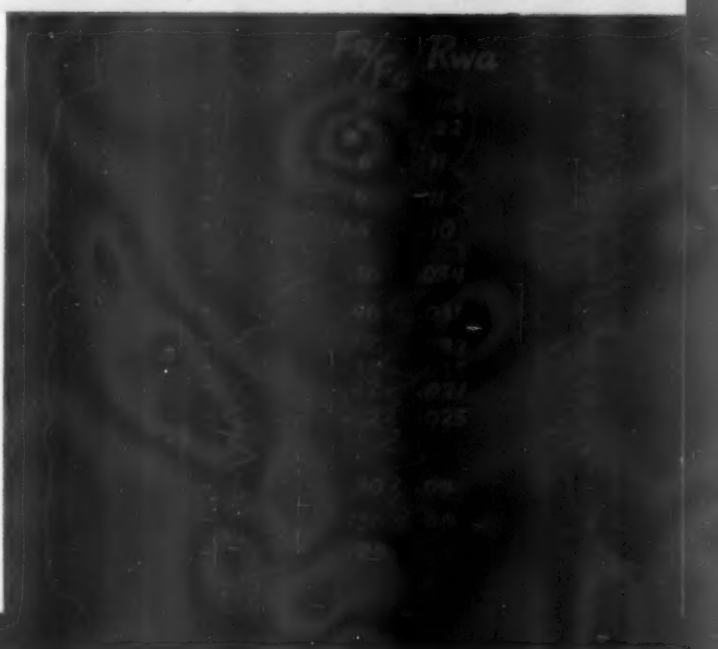
Oil and gas horizons are graphically identified by simple comparisons of Sonic and Resistivity data. These fast methods of interpretation are appropriate for well-site application. Potentially productive zones thus found can be further investigated by quantitative methods—or can be checked by sidewall cores and formation tests.

Ask a Schlumberger engineer in your area to demonstrate the benefits you can derive from Sonic and Resistivity Logs in your well program.

THE EYES OF THE OIL INDUSTRY®

SCHLUMBERGER



ANOTHER HOMCO
DIRECTIONAL DRILLING
SUCCESS REPORT

# Two Directional Drilling problems where Homco equipment saved hours of rig time

Gulf Coast independent operator says:

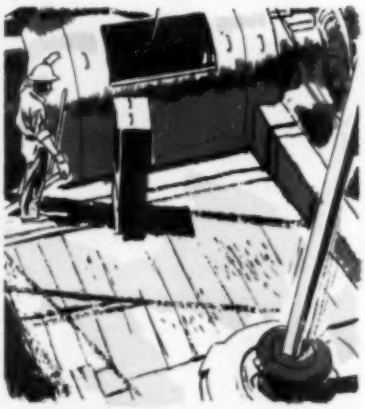
**"Homco's Mechanical Orienting Tool saved me eight hours and fifteen minutes wire line time on two settings below 14,000 feet."**

**Terrebonne Parish, Louisiana**

1. First whipstock was set at 14,363 feet with conventional BHO method and checked. Time required to orient tool was four and one-half hours. Second whipstock was set at 14,821 feet using a 6" O.D. Homco Mechanical Orienting Tool. Time required was thirty minutes. (Results were perfect.)

2. Third whipstock was set at 15,080 feet with the same Homco Mechanical Orienting Tool. Time required fifteen minutes. (Perfect results.)

3. The Homco Mechanical Orienting Tool saved more than four hours rig time each time it was used. It also eliminated the hazard of stuck pipe as the string can be actuated and circulation maintained. Abnormally high temperatures and extremely heavy muds have no effect on this tool.



## Homco Mechanical Orienting Tool*

The HOMCO Mechanical Orienting Tool presents a new concept for orienting whipstocks and deflecting tools without the use of subsurface surveying instruments, which previously required two or more trips with a wire line to correctly orient the deflecting tool. The drill pipe is raised, rotated, and lowered until a ball falls into a slot which permits the tool to close and indicates that the deflecting tool is correctly oriented.

**ADVANTAGES:** Eliminates numerous trips into the hole with subsurface surveying instruments. Reduces orienting time to approximately twenty (20) minutes. Torque in drill string does not affect setting. Not affected by high temperature. Write for Technical Bulletin #51-1-1.

*Patent—U.S. Letters Patent No. 2,686,660

**NEED THE ANSWER**

**TO A DIRECTIONAL DRILLING PROBLEM?**

**HOMCO HAS IT!**

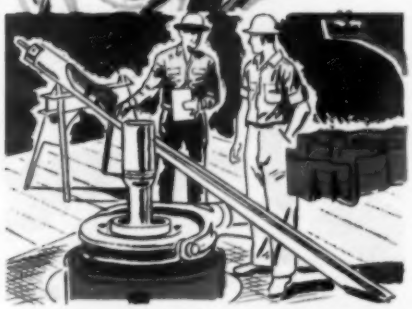
HOMCO

DIRECTIONAL DRILLING

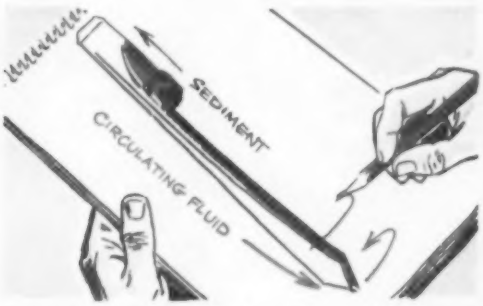
California tool pusher says:

**"Homco's Circulating and Releasing Whipstock is the only tool that circulates to the bottom of the hole and assures a firm setting for the whipstock."**

"We've learned now that when we have to set a deflecting tool in the hardrock country, it saves time and money to have the Homco Circulating and Releasing Whipstock on hand. It has saved us rig time in West Texas, California, the Rockies, and Canada."



1. The HOMCO C&R Whipstock is installed on the drilling string and is lowered into the hole. There is no danger of shearing the pins. Should a bridge or fill be encountered, the whipstock is raised, circulation started, and the tool is rotated through the obstruction.




2. On reaching the bottom of the hole, circulation is commenced to wash any sediment or cuttings free which may impede the setting of the whipstock. Circulation and rotation are continued until the whipstock can be set firmly on the bottom of the hole. The whipstock can now be oriented in the correct direction by means of the HOMCO Mechanical Orienting Tool, or by other sub-surface orienting means.

3. After orientation, a ball is dropped into the drill pipe and pumped down to land in the ball seat on the upper end of the piston in the setting tool. The pumps apply pressure to the piston assembly until the pins between the upper shell and piston are sheared. The piston is forced downward permitting the shear balls to be forced from a position between the whipstock collar and lower shell into the setting tool. This diverts the circulation from the whipstock to the drill bit and disengages the setting tool from the clutch arrangement in the whipstock collar by lowering the drill string slightly. When disengagement is accomplished, rotation is commenced and a rathole is drilled in the conventional manner.

## Homco Circulating and Releasing Whipstock*

In most directional drilling operations, a problem is the removal of sediment and cuttings that settle to the bottom of the hole after circulation ceases. This fill prevents the whipstock from reaching the bottom of the hole.

The HOMCO Circulating and Releasing Whipstock permits sediment to be circulated out of the hole before setting, eliminating mis-runs with whipstocks. The circulating fluid is channeled through the whipstock to the lowest point of the tool. While circulating, the HOMCO C&R Whipstock can be rotated without danger of shearing pins, assuring a firm seat.

**ADVANTAGES:** Eliminates danger of shearing pins while going into the hole. Whipstock can be rotated without danger of shearing pins. Circulation can be obtained at bottom of the tool where it is needed. Whipstock can be rotated and circulation maintained on bottom before setting, to assure a firm seat. Write for Technical Bulletin #94-7-1.

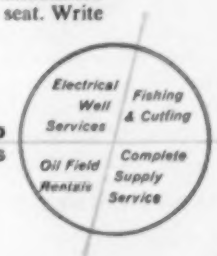
*Patent—U.S. Letters Patent No. 2,823,012

HOMCO

HOUSTON, TEXAS (HEADQUARTERS)

**EXPORT OFFICES**
New York, N.Y.
Mexico City, Mexico
Long Beach, California
Maracaibo, Venezuela
Paris, France
Geneva, Switzerland

**HOMCO ALSO OFFERS**



# IT'S ALWAYS HARVEST TIME FOR PROFITS WHEN YOU SELL SUN QUALITY LUBRICANTS

No one is more valuable to today's farmer than the man who helps him keep his expensive machinery running at top efficiency.

Combine quality products with reliable service, and you've built yourself a reputation.

Sun offers you a complete line of petroleum products and all the help you need to get across your quality-and-service story.

You can sell a Sun product under your own brand name anywhere. In many areas you can get a distributorship for Sunoco fuel oils and other branded Sun products. In some areas distributorships for Blue Sunoco gasolines are still available.

To get more information, write to SUN OIL COMPANY, Dept. PW-10, 1608 Walnut Street, Philadelphia 3, Pa. In Canada: Sun Oil Company Limited, Toronto and Montreal.

SUNOCO

*Quality...*

THE BEST ECONOMY OF ALL

ORIGINATORS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES

as the basis for designing treatments.

"Often the type and size of treatment are controlled by the personal likes and desires of the operator," the study reports, "although better results could have been obtained by modifying the treatment to meet the operator's own conditions."

Other operators were found to base their treatments on pumping capacity or service cost of a single truck or unit.

"Economically, this may be a good practice," say Powell and Johnston, "but it may not result in additional oil recovery."

**In arriving at the optimum fracture treatment for the Bartlesville sand, fracture data on 74 wells in this formation were compiled in the study.**

"In the Bartlesville-Dewey area and in the adjacent shallow oil-productive areas to the east, small initial treatments using 2,000 to 3,000 gal. of fracture fluid and 4,000 to 6,000 lb. of sand have been most effective," according to the study.

"When wells were refractured, best results were obtained when the size of the treatment was increased by approximately one-half that of the original."

The sand-oil ratio for most of the treatments studied was 2 lb. per gal. of fracturing fluid, but favorable results have been reached with a sand-oil ratio of 1 to 1.5.

Formation breakdown pressures in the wells involved ranged from a high of 5,064 psi. to a low of 1,263 psi.

On the basis of pounds of pressure required per foot of depth, the BOM engineers note, "It was of special interest that some of the shallow wells required higher breakdown pressures than those of greater depth."

Of the 74 wells on which data were compiled, 24 were in the Weber pool, Washington County, where the engineers observed that:

- Fracture treatments probably are more successful when the wells have been shot originally.
- Good records showing quantities of water previously injected and fluid produced are important indicators of sweep efficiency, and are necessary to indicate when wells need treatment.
- Newly drilled wells should be cored.
- Shale sections and those of low permeability react better to fracturing than do clean sand sections.
- Even in clean sand sections, fracturing increases ultimate recovery.
- When depleted gas sands lie on top of oil sands, fractures may extend into the gas zone and provide a channel for injected water to move directly to producing wells.

**Early recognition of joint and fracture systems in a producing formation is helpful, both during primary development and during later application of secondary recovery.**

"Systems of joints and fractures affect the results of fracture treatments," say Powell and Johnston.

"In formations having natural joints and fractures at the top of the productive sands, enlargement of such fractures may cause serious loss of injected water and impair the efficiency of the water drive."

The report cites one instance in which a core was taken from a new well, drilled within 25 ft. of an unsuccessfully fractured producing well. It showed that the initial horizontal fracture had been diverted by a natural joint into a vertical plane.

Enlargement of the natural joint resulted in penetration of an overlying water zone and failure of the fracture treatment.

In another case, the initial horizontal fracture was diverted into a vertical plane by a natural joint and penetrated a bottom-water zone. Here, too, the treatment was not successful.

**Natural joint systems at times can be beneficial in a waterflood.**

In one field, the BOM engineers found that a system of natural joints caused fractures resulting from hydraulic treatments to be oriented in one direction.

"Knowledge of this," the report says, "caused a change in the flood pattern which resulted in greater oil recovery from the project."

**The study resulted in five other general conclusions as to the use of fracturing in waterflood acreage in northeastern Oklahoma.**

(1) Hydraulic fracturing has resulted in increased rates of production and increased ultimate recovery from many waterflood projects.

(2) Fracturing has been quite effective in improving the performance of partially plugged wells.

(3) Most fracturing failures have occurred in edge wells fractured with a "standard-size" treatment used in wells having average pay thickness.

(4) Good results have been obtained in fracturing formations above and below water zones by utilizing planned well-completion procedures.

(5) Correlation of known fracturing techniques with reservoir characteristics, production histories, and well-completion methods is important in selecting optimum fracture treatments for a given field or area.

**A new development from Plastic Applicators, Inc.**

Plasticap "HTP," a thermosetting-plastic, corrosion-control coating designed to give tubing more protection—longer—is the newest product to come from Plastic Applicators' progressive research program.

**PLASTICAP "HTP" PROVIDES:**

Higher resistance to the corrosive effects of organic acids, hydrogen sulfide, salt water, super mud acid, and caustic muds (to pH 13.5) even when exposed to temperatures above 350° F.

Superior adhering qualities above 400° F. Will not chip, peel, or crack.

New standards of elongation and compression performance. Plasticap "HTP" offers full-circle protection. The best protection you can buy for deep, medium, or shallow wells.

Complete laboratory test report available on request.

Plasticap
PLASTIC APPLICATORS, INC.
REGD. T.M.

Main Office: 7020 Katy Road,
P. O. Box 7631, Houston, Texas.
UNderwood 9-3611.

Plants: Harvey and Morgan City, La.
Houston and Odessa, Tex.

LIGHTWEIGHT breathing apparatus contrasts with old method of using air tank (left).

MOBILE AIR COMPRESSOR provides inexhaustible supply of air through hoses to crew members working in deadly hydrogen sulfide areas of Alberta.

# Better Poison Gas Protection Devised

**A portable air compressor unit with attaching hoses and face masks promises more comfortable and economical protection against the deadly hydrogen sulfide gas found in some areas of Alberta.**

Because of the high concentration of this gas at wellsites in such areas as Joffre, Wimborne, and Innisfail—where the unit has been tested—the Alberta government requires the use of breathing apparatus in any contaminated area.

The general practice has been for crews engaged in drilling and servicing wells in a polluted area to wear an air tank and face mask.

The air tank, with attachments, weighs about 40 lb. and has a 20-minute air supply.

**The new unit provides an inexhaustible supply of air to the worker, and the weight carried by each man is just 10 lb.**

This is considered a definite advantage because of the lessened weight and discomfort and the elimination of the time-consuming change of air tanks every 20 minutes.

The government says the air-tank method of protection costs the company about $250 per unit and a further expense of $260 per tour for refilling and supplying air tanks.

The air compressor unit, which was developed by Kenyon's Oilfield Servicing Co., Ltd., has an initial cost, including attachments, of about $3,500.

Air is drawn into the machine and forced through a silica gel and carbon filter to remove all moisture.

There also is a castor oil filter, because the compressor unit is lubricated with castor oil to prevent accumulation of carbon monoxide.

**A 150-ft., 1½-in. hose connects the compressor to a header attachment with four snatch attachments leading to individual air outlets.**

The header attachment is placed well above the rig floor so that all individual hoses hang down and are out of the way as much as possible.

The dry air is forced from the compressor tank past two gauges that record any incidence of carbon monoxide or hydrogen sulfide.

A plug at the back of the belt part of the harness is the link between the hanging individual air hose and the breather hose.

# Tubing Has 'Buttress' Threads

**A non-upset tubing joint, called "buttress thread," provides added clearance between tubing and casing in multiple completions.**

Developed by National Tube division of U.S. Steel Corp., the new thread has a buttressed side, differing from the old tubing thread, which is triangularly symmetrical.

The buttress threads have a zero-degree pulling face and a 45-degree flank angle on the compression side, with broad flat roots and crests parallel to the major axis of the pipe.

Prior to this development, it also was necessary to upset tubing before threading. The buttress thread design, on the other hand, is applied to plain end, non-upset tubing (picture).

**Several additional advantages are claimed for the new buttress thread tubing joint.** Among them, according to Henry J. Wallace, National Tube's president:

- Pipe and couplings can be stabbed together on normal drop impact, without thread damage or cross-threading.
- Maximum well clearance is provided, with full inside diameter to assure maximum flow.
- Pipe can be easily rethreaded in the field.
- Pipe-coupling joints can be

CUTAWAY shows outside diameter of regular coupling for 2⅜-in. buttress thread tubing is 2.875 in., compared with 3.063 in. for external upset coupling.

Macks are the muscles of the oil fields. Here one of Hilderbrandt's B-75 Model Macks loads up for a rugged off-highway run to a remote drilling site. Roadless terrain is taken in stride because Mack oil field trucks are built for oil field work.

MACK
for over 7 straight years
NO.1
by far in sales of diesel trucks

*Hardworking oil field Macks*

# Help smooth drilling operations

Breakdowns or tie-ups have no place in the round-the-clock trucking operations of Hilderbrandt Tank Service, Inc., Lindsay, Oklahoma. On 24-hour call, their vacuum tank trucks must roll on a moment's notice with pressurized loads of drilling mud, frac-oil and other compounds used to smooth the kinks out of oil drilling operations.

Says President Floyd Hilderbrandt, "Oil-field service offers some of the worst off-highway truck operating conditions. We use Macks on these rugged jobs because they outperform any of the other units we operate, give us good economy and work with an absolute minimum of downtime."

When your vehicles must tackle unusually demanding terrain conditions, Macks will perform where other trucks bog down—in mud, loose gravel and sand—thanks to Mack's exclusive Balanced Bogie with Power Divider. It's a four-wheel drive, tandem rear-axle assembly with an inter-axle differential that directs the most power to the wheels having greater traction. The Power Divider allows for differences in speed between wheels, maintains traction in slippery going and preserves true differential action without surging or vibration. Mack-built Thermodyne® engines—gasoline or diesel—are unexcelled for long life, dependability and fuel economy. Mack-built transmissions—available up to 20 speeds—are built to accommodate a variety of power takeoff units.

In oil field service—as in any operation where more is demanded of a truck—you'll get more out of a Mack. Your Mack branch or distributor will be glad to show you why. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7507

**MACK**
FIRST NAME FOR
**TRUCKS**

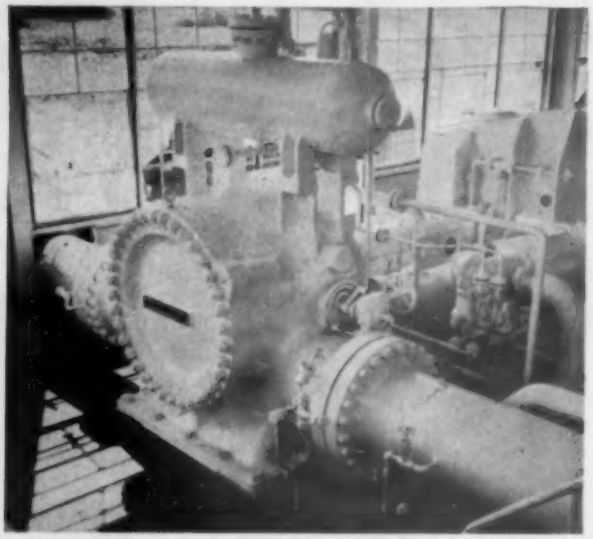
CENTRIFUGAL COMPRESSORS

# DE LAVAL welded impeller permits higher horsepower, higher tip speeds, greater design flexibility

Now, with a single welded wheel, compressors rated up to 20,000 horsepower at 6500 rpm are giving excellent service.

Produced by a special welding process developed by De Laval, this new welded wheel construction permits higher tip speeds and fewer stages for a given pressure ratio.

Write for more information on this new welded impeller or contact your local De Laval representative.



Rated at 20,000 horsepower, this compressor, on stream for a prominent pipeline company, is capable of developing a pressure ratio of 1.56 in a single impeller, pumping 800 MMSCFD at an inlet pressure of 652 psia and an outlet pressure of 1020 psia.

DE LAVAL STEAM TURBINE COMPANY
897 NOTTINGHAM WAY, TRENTON 2, N. J.

DL-490 B

minimum of 12 times without thread made up and broken in the field a damage.

• Buttress threads in couplings are tin-plated to assure maximum protection against leakage, to withstand pressures to 15,000 psi., and to reduce make-up torque and tonging.

National buttress thread tubing is presently available in J, N, and P grades in 2⅜-in. and 2⅞-in. outside diameter. Other sizes will be available later.

## Humble Is Drilling Two Georgia Wildcats

**Humble division of Humble Oil & Refining Co. has started drilling on the first of its two wildcats in opposite corners of Georgia—a state still looking for its first production.**

"Both wildcats are long shots," says a company spokesman. "We are hopeful, but not really optimistic, that the tests will be able to bring oil or gas production to Georgia."

**The first test, scheduled to go to 10,000 ft., was spudded recently in the southeast corner of the state,** by Rowan Drilling Co.

The wildcat is located in a pine forest 1 mi. from the Altamaha River, 7 mi. north of Gardi, Wayne County.

If carried to its projected depth, the test will exceed the previous deepest hole in the state by some 3,000 ft.

**The second wildcat will be started shortly in Lake Seminole, in the extreme southwest corner of the state.**

This test is less than 3 mi. from the Florida border. The operation will get under way as soon as a barge rig is moved to the drillsite.

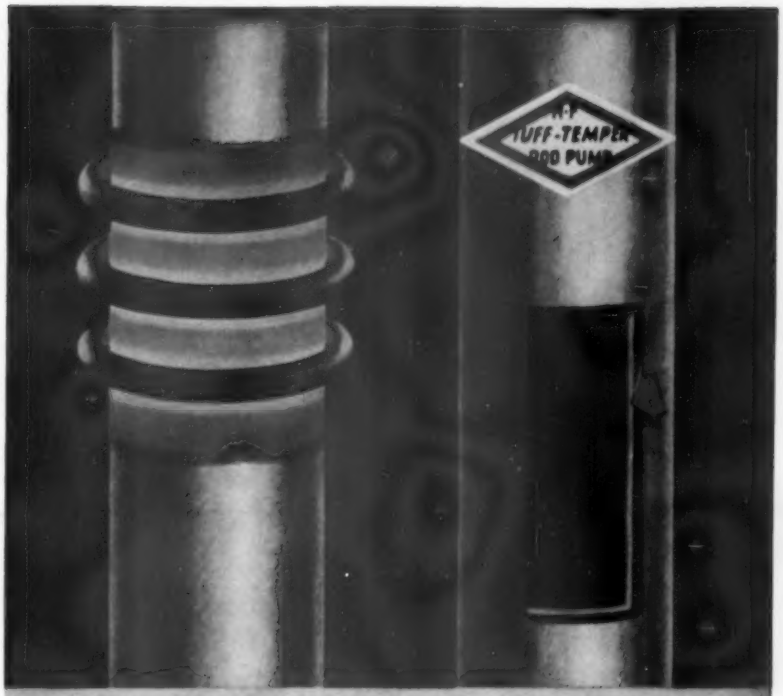
This test is projected to 4,500 ft. to test the Lower Tuscaloosa sands of the Cretaceous.

The nearest Tuscaloosa production is in the Pollard pool in Alabama, 140 mi. west of the Humble test.

**Doubts over the outcome of the two wildcats are justified. Reason: There have been 93 dry holes drilled so far in the nonproducing state.**

The first wildcat was drilled in 1938 in Pierce County. Humble drilled one of the later dry holes—a 4,500-ft. test in 1949 in Echols County. Humble has spent some $2-million in bonuses and rentals for the more than 500,000 acres of leases it holds in Georgia, and will spend an additional $250,000 on the Wayne County wildcat alone.

There is an added incentive to operators: a $250,000 bonus offered by the state for the operator who completes the first 100 b/d well.


*Through the Magic of Electronics...*

**Tuff-Temper® Barrel Tubes Run Longer in Pumping Abrasive Fluids**

For the longest and most dependable service from a sub-surface pump running in abrasive fluids, your best choice is a barrel tube with a hardened wearing surface. From that point on, the rest is easy: Run a Tuff-Temper pump — the Best Pump in the Oil Patch to resist the abrasive effects of sand, scale, etc., that would cause undue wear and shorten the life of the pump.

Electronics puts the toughness and the temper in Tuff-Temper barrel tubes — where the wear-resisting properties are most needed. Each tube is heat treated by high-frequency induction hardening machines, the latest and surest method for exact control of temperature for uniform hardness and dense grain structure. The hard wearing surface produced by this method extends to a depth of 1/32", and the outer portion remains ductile and shock-resistant.

After the induction hardening process, the tubes are straightened on special machines, the inside working surface is expertly honed and polished to a mirror finish, and each barrel is checked against a full set of A.P.I. gauges. Heavy-duty pumps for deep-well production and chrome-plated plungers for extra hard wear can be furnished if desired.

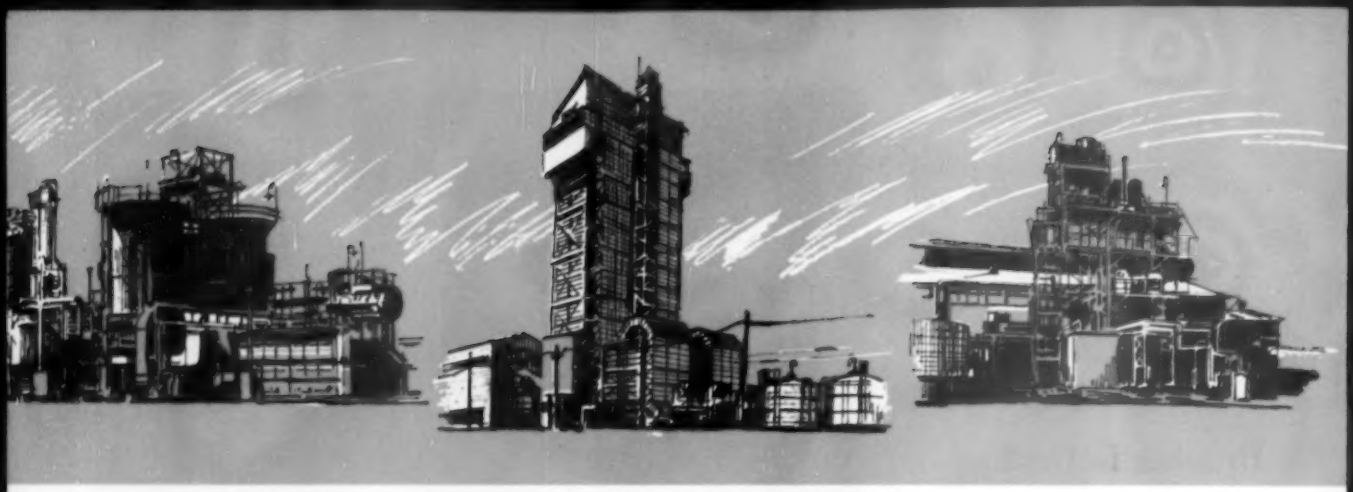
Leading stores carry Tuff-Temper rod and tubing pumps in a wide range of A.P.I. types and sizes. You can obtain complete details and illustrated literature from your own store, one of our many factory warehouses or field representatives, or by writing to us at P. O. Box 2477 in Fort Worth. There is no obligation, of course.

HF

"BEST PUMPS IN THE OIL PATCH"

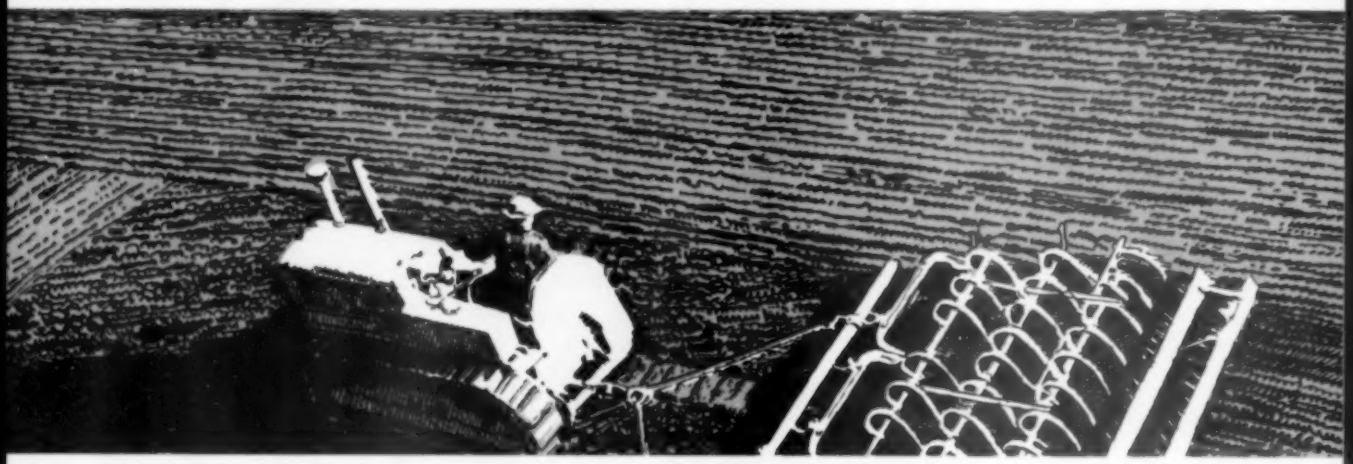
**HARBISON-FISCHER MFG. CO.**

**FORT WORTH**



# Chemicals for the soil...

***Chemico has production-proven processes for the major fertilizer chemicals***



*ammonia / ammonium sulfate / ammonium nitrate*
*ammonium phosphate / superphosphate*
*triple superphosphate / urea / complex fertilizers*
*nitric acid / sulfuric acid / phosphoric acid*

In India, Pakistan and Japan; in England, France and Italy; in Hawaii, Sumatra and Formosa; in Australia, South Africa and South America; in more than half the states of the Union and in every highly populated area on earth, Chemico-designed plants are producing basic fertilizer chemicals to increase world food production.

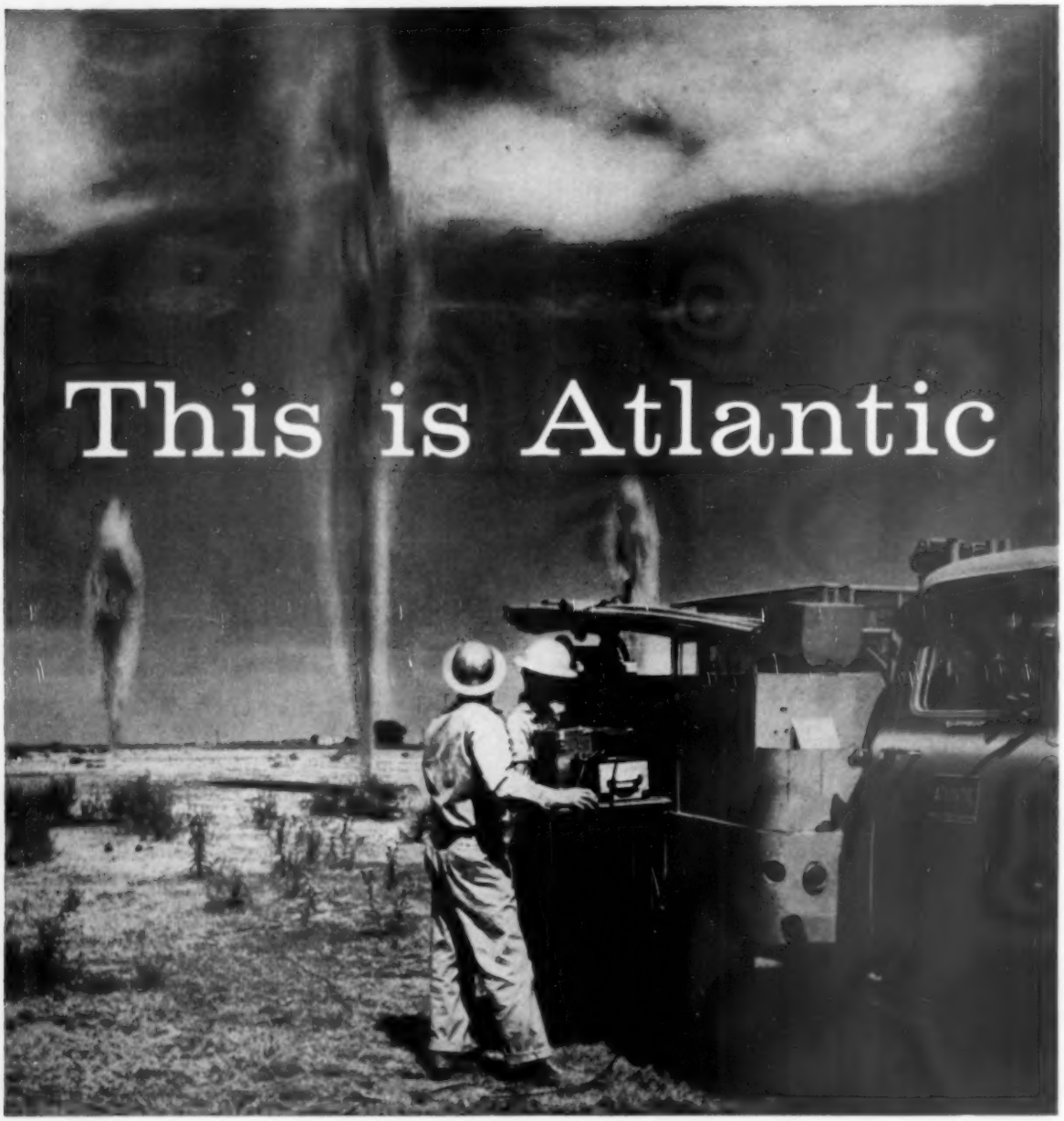
Chemico's experience in designing plants to produce fertilizer chemicals is unmatched by any other engineering company in the world. More than 200 Chemico sulfuric acid plants are now in operation. Sixty-five Chemico ammonia plants are on stream or under construction. In January of this year, Chemico completed its thirty-fourth nitric acid plant. Other Chemico plants now in production or under construction have capacities for producing 3,700,000 tons per year of ammonium sulfate and 1,600,000 tons per year of ammonium nitrate. When the capacity of the Chemico urea plants now under construction in Pakistan and the U. S. is added to what is being produced at plants in Japan, Canada and elsewhere in the U. S., the Chemico urea process will account for more than 400,000 tons per year.

Chemico's proven processes are transformed into efficient operating plants with maximum speed and with minimum expense to the client. Ease of start-up and low operating costs are just two of the more obvious advantages of Chemico plants. If your company is considering the construction of additional production facilities, or the expansion of your present plant, Chemico will help you find the most efficient and economical solutions to your process problems.

CHEMICO

CHEMICAL CONSTRUCTION CORPORATION
525 West 43rd Street, New York 36, New York

CHICAGO · DALLAS · PORTLAND, ORE. · HOUSTON · TORONTO · LONDON · PARIS · JOHANNESBURG · TOKYO




**PRODUCTION:** Atlantic searches for oil...actively developing new sources of crude across America and other parts of the world to meet future needs for quality gasolines, heating oils, lubricants, waxes, heavy fuels, asphalts, petrochemicals and jet fuels. Look to Atlantic to continually serve industry with high-quality products at lowest possible cost.

ATLANTIC

THE ATLANTIC REFINING COMPANY

Producer, refiner and marketer of quality petroleum products

# What's New / IN EXPLORATION, DRILLING, PRODUCTION

## New Mexico Group Hits Lease Rental Increase

**The U. S. Bureau of Land Management's proposal to increase annual rental rates on public lands is being attacked by the public lands committee of the New Mexico Oil & Gas Assn.**

The association last week adopted a resolution protesting the bureau's proposal to raise rentals from 50¢ to $1 per acre during the last five years of a ten-year lease (PW—Oct.14'60, p15).

Senator Clinton P. Anderson (D., N.M.) told the group that, "The [oil and gas lease] bill was aimed at raising the minimum to 50¢, which it did. Before the Interior Dept. charges a higher rate, it should have a good reason, and justify the higher charge at hearings."

•

## Wilmington Subsidence Rate Is Declining

**Subsidence rates in the Long Beach district of California's Wilmington field show a noticeable decrease.**

Harbor Dept. engineers report that measurements of elevations of bench marks indicate that the "zero" line of no subsidence has extended from Pier A northwesterly across the Naval Shipyard to Seaside Blvd. and Henry Ford Ave. At the center of the subsidence bowl, the measurements for the period from May to August of this year indicate a subsidence compaction of only 0.5 ft. per year, compared with 0.7 ft. from August, 1959, to August, 1960.

A total of 365,257 b/d of water is presently being injected through 136 wells in the field.

•

## Properties Change Hands

**Texas American Oil Corp. has bought an approximate 17% working interest in four producing properties in West Texas and New Mexico from J. T. Miller Trustee.**

The Texas properties are two wells in the Camar field, Schleicher County; and one well in Wattsfield, Nolan County.

The New Mexico properties are three wells in North Shugart field and one well in Empire (Abo) field, both in Eddy County.

Price was not revealed.

**Amurex Oil Co. has sold its interest in Hatton gas field, southwestern Saskatchewan, for $1,937,000.**

The sale was for cash to Saskatchewan Power Corp., owned by the province and the only purchaser of gas produced in the province. Hatton field, opened by Amurex in 1953, now has 27 gas wells.

**Cities Service Oil Co. has agreed to buy the interests of G. C. Parker, Tulsa, in 9,500 acres of producing and nonproducing leases in three Oklahoma counties.**

The acreage is in Love, Jefferson, and Carter Counties.

**Honaker-Davis Drilling Co. has sold 45 wells, 12 of them gas, to Graridge Corp., Breckenridge, Tex.**

The wells are located in central and western Kansas. Price was not disclosed.

Honaker-Davis is being dissolved and superseded by Davis Drilling Co.

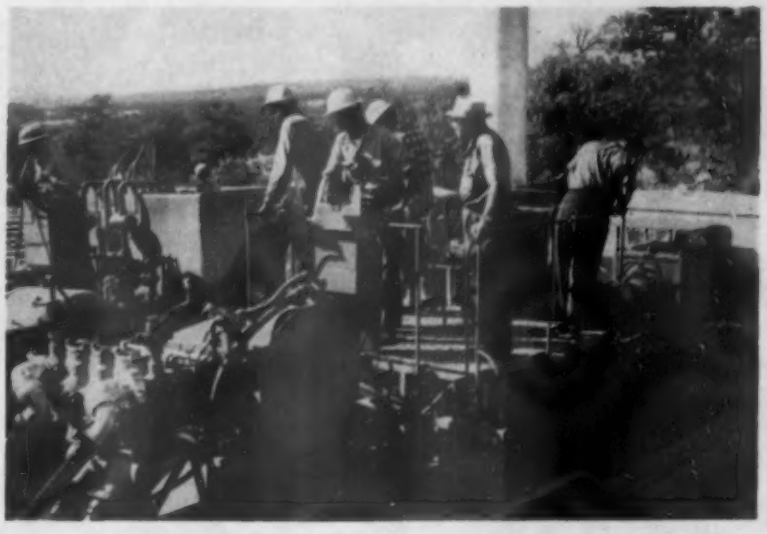
•

**Drilling reservations on oil and gas rights covering 60,404 acres in central and southern Alberta have netted $2,511,546.**

A total of 77,846 acres were offered in the Oct. 6 sale. Largest single price per parcel was paid by Altana Exploration Co.—$712,000 for 8,640 acres in parcel No. 746.

•

**The California Co. has asked the state of Florida for permission to**



## Gas Turbine Used on Fracturing Unit

**Halliburton Co. last week made the first use of a gas turbine engine on any mobile oilfield service equipment (PW—Jul.1'60,p21). The turbine was used as the pumping power source for two successful fracture treatments. The initial field test of the unit was on two Kenneth D. Kiester wells in the Santa Fe field, Stephens County, Okla.**

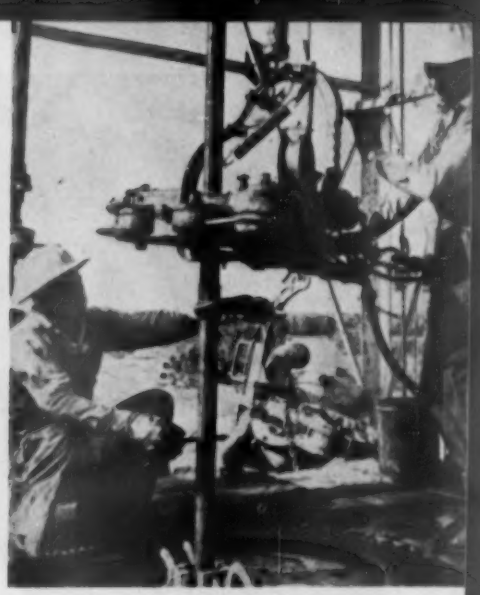
**The unit consists of a conventional truck base mounting a standard Halliburton HT-400 pump, powered by General Electric's 900-hp. Model 720 axial-flow turboshaft gas turbine.**

**On one of the two field tests, 18,000 gal. of water and 20,000 lb. of sand were pumped down casing at a maximum rate of 24 bbl. per minute and a maximum pressure of 1,750 psi. On the other, 20,000 gal. of water and 20,000 lb. of sand were pumped at a maximum rate of 30 bpm. and a maximum pressure of 1,750 psi. Pumping time was 22 minutes on the first test and 17 minutes on the second.**

*In production equipment, quality is the only key to extra service, reduced final costs....*

# Quality Equipment Cuts Costs

Cabot Catalog 60 gives you complete specifications on the new Equalign and the Equalastic Adjustable Crank Balanced Series and the Beam Balanced Series. Each Cabot Series has advantages worth your study and consideration; advantages based on minimum maintenance and dependable performance. Call your J&L Supply man for complete information.



J&L Tubing (upper right) plus Axelson Bottom Hole Pumps and Sucker Rods point the way to production economy. The extra service and reduced maintenance of quality equipment assure lower real costs.

J&L offers a complete line of casing and tubing, including special designs for problem production.

Fast dependable service is available from J&L pump shops to back up your investment in quality.

Our Shreveport district office and store (below) is one of many well stocked locations ready to serve you. For quality equipment to cut your real costs... see your local J&L man... and save.

**Jones & Laughlin**

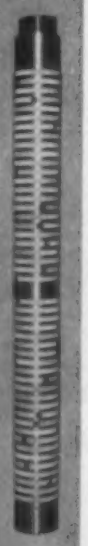
**SUPPLY DIVISION** – Tulsa

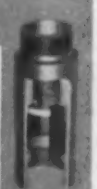
If it's sold by J&L....
It's the best available

110

Let R-u-b-b-e-r Take The Wear
in your sucker rod pumps

IT COSTS YOU LESS THAT WAY





● MARTIN RUBBER & DUCK RINGS give excellent life in dirty abrasive fluids . . . high or low gravity . . . much or little water . . . shallow or deep wells. They last for years in the easier pumping wells. Replacement rings cost comparatively little.

● MARTIN PLUNGER BODIES, precision grooved, drilled and threaded (no underneath fluid passage), usually last for years. Tube or barrel costs are often cut in half.

● The replaceable SYNTHETIC RUBBER GUIDES in MARTIN CAGES last longer than any metal, and the cushioning of the ball increases your ball & seat life. Results are often truly amazing. (Patent No. 2,591,174)

*Write for our new 1960 catalog or see it in the new Composite (24th Edition). All products sold thru supply companies.*

JOHN N. MARTIN
*Manufacturer*
S. W. BRADY STREET • TULSA, OKLAHOMA

**drill in the Gulf of Mexico, some 30 mi. off the Marquesas Keys.**

Robert Vernon, state geologist, recommended that the permit be approved and that the fee be placed in escrow until final determination is made of the official Florida shoreline under the recent U.S. Supreme Court decision. The Marquesas Keys are due west of Key West, off the southern tip of Florida.

•

**Damar Production Co. is being merged with Aeco Corp., Los Angeles.**

The merger, which needs only approval by the California Commissioner of Corporations to become effective, will boost Aeco's total oil reserves to 8.5-million bbl.

The principal assets of Damar, which will operate as an Aeco subsidiary, are in the Redondo Beach area of California.

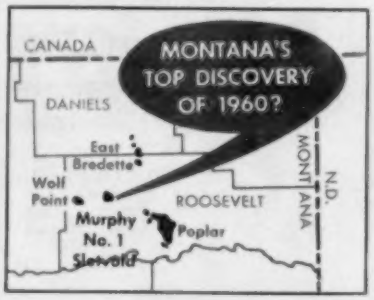
•

**The Consolidated Ute Indian Agency will offer 18,943 acres of tribal and allotted lands for leasing on Nov. 15.**

The acreage includes 27 tracts scattered through Archuleta, La Plata, and Montezuma Counties, Colorado, and San Juan County, Utah.

•

## Drilling Highlights




**Montana**—Murphy Corp. No. 1 Sletvold, section 18-30n-48e, Roosevelt County, flowed 42-gravity oil at the rate of 87 bbl. per hour through 7/16-in. choke on drillstem test at 7,664-80 ft. in the Nisku (Devonian). Nearest Devonian production is 35 mi. northeast at the one-well Redstone field, Sheridan County. The Madison is productive 15 mi. southeast at Poplar field.

**New Mexico**—El Paso Natural Gas Co. No. 1 Lusk Deep Unit, section 19-19s-32e, Lea County, flowed 98 bbl. of oil in 2 hours through ¼-in. choke and gas at the rate of 8-million cf/d through ⅜-in. choke on drillstem test at 11,148-198 ft. in the Strawn, and flowed 21 bbl. of oil per hour and gas at the rate of 1.2-million cf/d on drillstem test at 8,757-825 ft. in the Bone Springs. The prospect, which is planned for dual completion, is in the shallow Lusk pool.

**West Texas**—Santiago Oil & Gas Co. No. 1 Joe T. Davidson, section 21, block F, GC&SF survey, Crockett County was completed for 28.5-million cf/d of gas on open flow through perforations at 8,912-9,058 ft. in the Strawn. The well is 2¼ mi. east of Baggett field.

**Kansas**—Cities Service Oil Co. No. 1-A Sutton, section 33-34s-41w, Morton County, flowed gas at the rate of 104-million cf/d of gas on open flow, after acidizing, through perforations at 4,970-90 ft. in the lower Morrow. The discovery is 1 mi. east of Wilburton field.

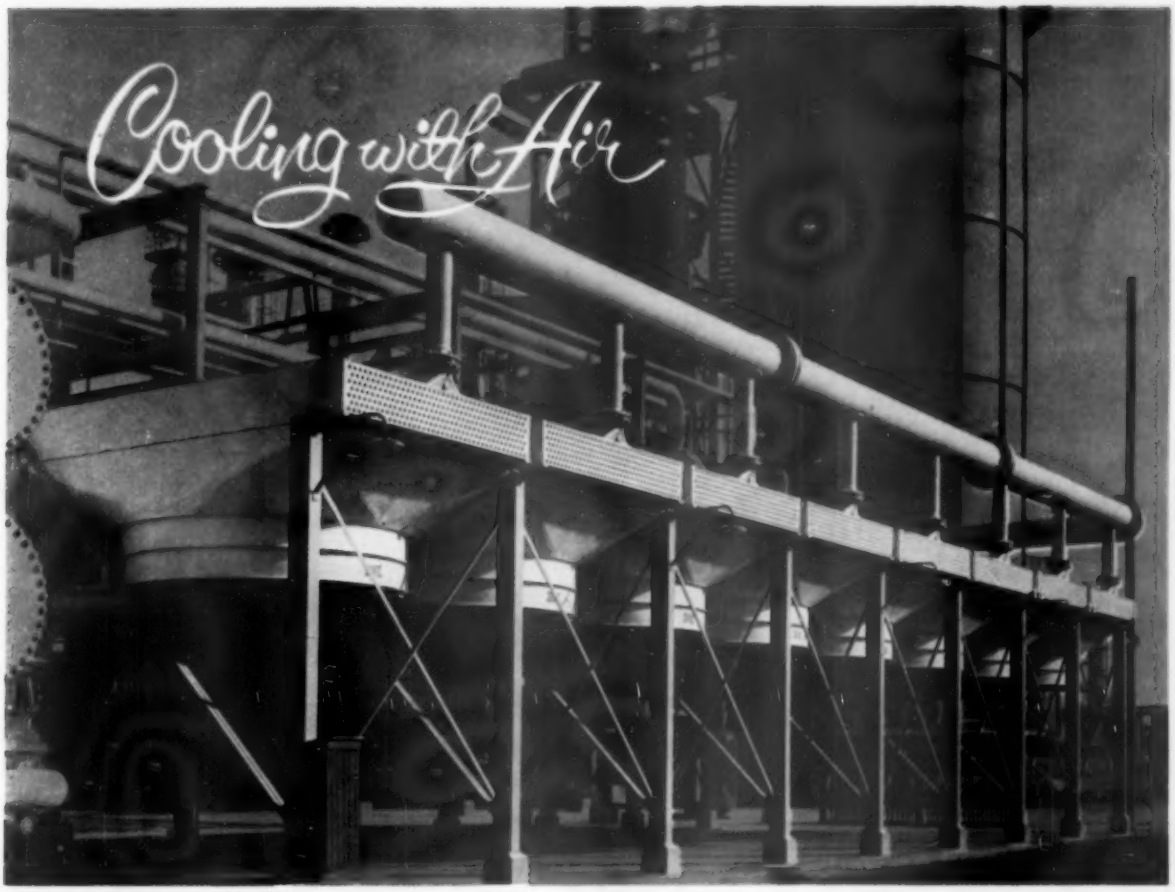
In Ellis County, Drilling & Exploration, Inc., No. 1 Gottschalk, section 4-14s-20w, recovered 300 ft. of oil and 120 ft. of oil-cut mud on 60-minute drillstem test at 3,930-35 ft. in the Arbuckle. The prospect is 1¼ mi. southwest of Pleasant field.

**East Texas**—Sunray Mid-Continent Oil Co. No. 1 Grogan Minerals, E. Vickers survey A-1062, Cass County, was completed for 120 b/d of oil through ¼-in. choke and perforations at 10,327-44 ft. in the Bossier lime. The wildcat is 2½ mi. northeast of East Linden (Cotton Valley) field.

**Wyoming**—Union Oil Co. of California No. 1 Government, section 29-37n-64w, Niobrara County, flowed 53 bbl. of oil through notches at 7,426 ft. and 7,428 ft. in the Mowry sand. There is no other Mowry sand production in the Powder River Basin.

**Nebraska**—E. A. Obering No. 1 Foster, section 27-3n-36w, Dundy County, recovered 130 ft. of oil, 60 ft. of mud-cut oil, and 20 ft. of oil-cut mud on 60-minute drillstem test at 4,305-18 ft. in the Lansing-Kansas City (Pennsylvanian) formation. The prospect is located 13 mi. northeast of Pennsylvanian production at Jones pool.

**Colorado**—Humble division of Humble Oil & Refining Co. No. 1 Sawmill Hill unit, section 36-2n-92w, Rio Blanco County, recovered 37 ft. of limestone and dolomite either bleeding or oil stained in two cores of the Paradox C zone at 3,250-73 ft. and 3,273-99 ft. The wildcat is 8½ mi. southwest of Thornburg field.




## IN THE BAYWAY REFINERY...

of the Esso Standard Division of Humble Oil and Refining Company.

The above pictured installation of HUDSON Solo-aire units obviated costly addition to the existent and comparatively high-maintenance-cost water system.

Over-all economic comparisons of HUDSON Solo-aire cooling versus water cooling almost invariably result in selection of Solo-aire units for much or all process cooling.

In two complete 40,000 barrel seaside refineries constructed abroad, Solo-aire units are used for ALL process cooling services. NO WATER IS USED FOR PROCESS COOLING.

In the United States in a 40,000 barrel refinery built adjacent to an unlimited water supply, 50% of the total dissipated heat is transferred directly to air through Solo-aire units.

Operating results of thousands of HUDSON Solo-aire units installed in oil, gas and chemical plants throughout the free world have established HUDSON leadership in the field of direct cooling with air.

**ONLY HUDSON designs and manufactures ALL THREE categories of cooling equipment . . . for cooling solely with air (Solo-aire); for cooling primarily with air but with minimum water to obtain low effluent process stream temperatures (Combin-aire); and water cooling towers. Take advantage of HUDSON'S objective assistance in selecting the integrated cooling system which best balances capital investment and operating cost for the specific process, climatic, and water conditions.**

**HUDSON**

**ENGINEERING CORPORATION**

**BRAEBURN STATION • HOUSTON, TEXAS**

OFFICES: 16033 Ventura Blvd. Encino, California • 122 East 42nd St. New York 17, N. Y. • 199 Bay Street Toronto, Ontario, Canada • 17 Stratton St. Piccadilly London W. 1, England • Corrientes 1115 Buenos Aires, Argen. • Rua Mexico 45 Rio de Janeiro, Brazil

# You save drilling dollars with

# THE

**MUD PROBLEM:** Maintain a stable bay-water mud to drill through hydratable shales and formations containing high pressure gas and salt water.

### WELL DATA

*Location:* Timbalier Bay Field, Lafourche Parish, Louisiana
*Total Depth:* 15,376′

### MUD ADDITIVE PROGRAM

| | |
|---|---|
| 0′ to total depth | Q-BROXIN*, BAROID**, bay water, caustic soda, gypsum. |
| 12,876′ | Mud density increased to 12.3 ppg; Q-BROXIN treatment increased; Baroid Mud Centrifuge installed. |
| 13,276′ | FINE MICATEX**, and other lost-circulation materials added, maintained to total depth. |
| 14,302′ | Diesel oil added, maintained at 6% to 10% by volume to total depth. |
| 14,510′ | TRIMULSO** (0.5 lb/bbl) and E P MUD-LUBE†, (4.0 lb/bbl) added, maintained to total depth. |

### TYPICAL MUD PROPERTIES

| Depth, feet | 12,950 | 13,464 | 14,064 | 14,510 | 15,003 | 15,376 |
|---|---|---|---|---|---|---|
| Weight, ppg | 12.1 | 12.5 | 13.3 | 14.3 | 15.6 | 16.6 |
| Ave. sp gr, solids | 2.8 | 3.0 | 3.0 | 3.2 | 3.8 | 3.7 |
| Viscosity, sec. API | 55 | 48 | 54 | 66 | 58 | 65 |
| Stormer Gel, 10 min | 25 | 25 | 20 | 10 | 7 | 15 |
| Filtrate, ml, API | 5.5 | 4.9 | 3.9 | 1.6 | 1.8 | 1.2 |
| pH | 10.9 | 10.4 | 11.1 | 10.4 | 10.2 | 10.6 |
| Chloride, ppm (1000's) | 19 | 23 | 21 | 23 | 22 | 23 |
| Oil, % | 0 | 0 | 0 | 6 | 9 | 7 |

### CASING PROGRAM

| *Size Inches O.D.* | *Depth Set Feet* |
|---|---|
| 13⅜ | 6,464 |
| 9⅝ | 14,871 |

**DISCUSSION:** Major difficulties were anticipated below 14,000′ because of gas-bearing hydratable shales. Side wall coring, electric and induction logging and similar operations required an exceptional mud program. Salty bay water was used for making-up the liquid phase of the mud.

**SOLUTION:** Q-BROXIN mud was chosen as the basic mud additive from surface to total depth. The treated mud had a high degree of tolerance for solids, an inhibitive effect on hydratable shales and was not greatly affected by contaminants. BAROID was added to maintain weight, and FINE MICATEX was used to maintain good hole condition below 14,500′.

Total mud cost was about one-half the cost of previous wells of similar depths. 14,871′ of 9⅝" casing was successfully set and cemented, the deepest of this size in this field. Side wall cores and good logs were obtained without difficulty.

**Registered Trademark, Baroid Division National Lead Company
†Trademark, Baroid Division National Lead Company
*Registered Trademark of Puget Sound Pulp and Timber Company

*a Baroid Mud Program*

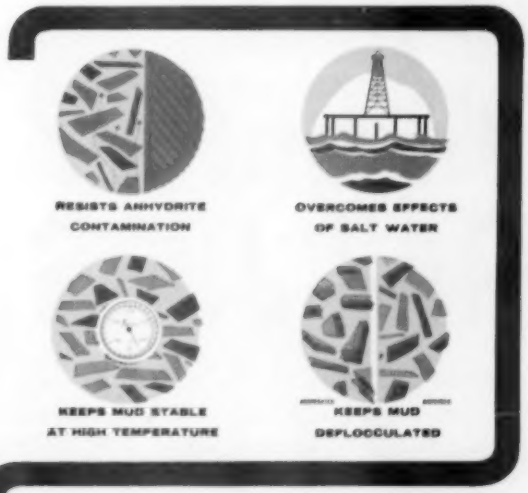
# MUD PROBLEM

## ...and its solution

Total mud costs were cut in half and tight-hole problems were solved in this typical case history of a Baroid mud program. Through experienced engineering skill, a combination of Baroid mud additives were matched against a combination of down-hole conditions with successful results.

Gas pressure, salt contamination and tight-hole conditions were expected at depths below 14,000′. Side wall coring and electrical logging were desired. Using a bay-water — Q-BROXIN mud, frequent pilot testing, and special-purpose Baroid additives permitted successful drilling of the well and setting 9⅝″ casing to a record depth in this field.

This demonstration is repeated daily in every major oil area. Baroid's improved concept of mud marketing is winning approval. By integrating material production, engineering research and distribution into a single chain, administered with utmost integrity, Baroid solves your problems and *saves your drilling dollars.*


RESISTS ANHYDRITE CONTAMINATION
OVERCOMES EFFECTS OF SALT WATER
KEEPS MUD STABLE AT HIGH TEMPERATURE
KEEPS MUD DEFLOCCULATED

**BAROID**

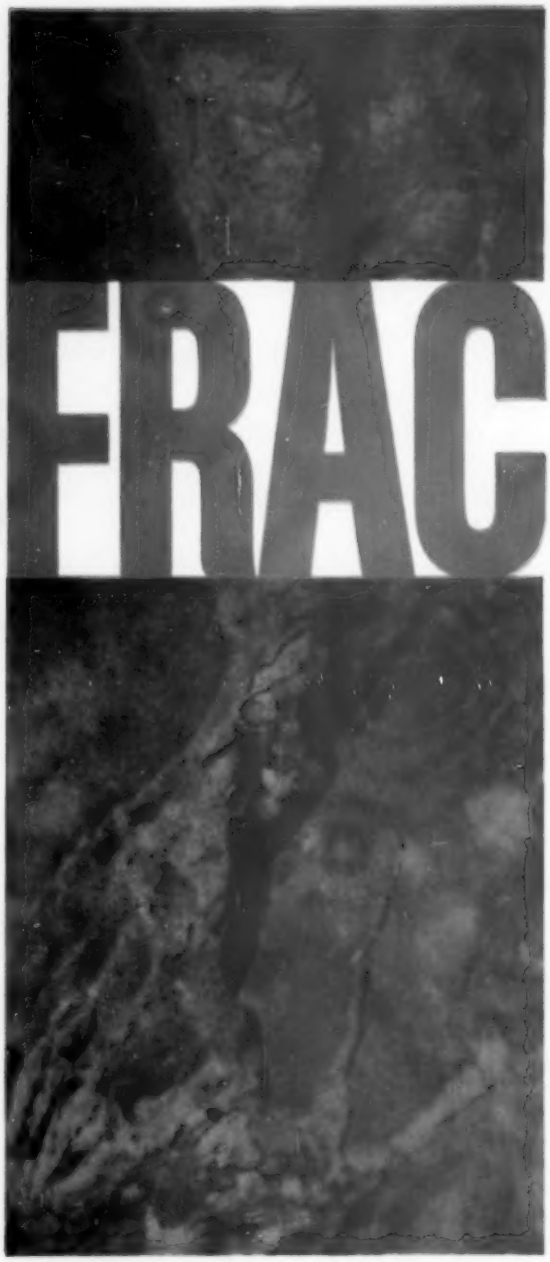
**BAROID DIVISION NATIONAL LEAD COMPANY**

MAIN OFFICE: P. O. BOX 1675, HOUSTON 1, TEXAS

6008

# LIQUID HUMBLE FRAC CONCENTRATE

# FOR BETTER FRAC JOBS



HUMBLEFRAC CONCENTRATE is a liquid-type fluid loss additive that can be accurately measured into the fracturing oil to obtain the optimum blend. With HUMBLEFRAC CONCENTRATE more of the fluid remains in the fracture system, to extend the fracture and allow propping sand to be placed.* It increases the sand-carrying capacity of the fluid. HUMBLEFRAC CONCENTRATE contains no solids to harm conductivity of the fracture, or to cause permeability damage. Return of frac fluids is quick and complete. HUMBLEFRAC CONCENTRATE is available in 14 and 55 gallon drums and in bulk. For complete technical information, call your Humble salesman or contact Humble Oil & Refining Co., Houston, Texas.

HUMBLE

**HUMBLE OIL & REFINING COMPANY**

* HUMBLEFRAC CONCENTRATE has been tested and proved in actual reservoir rock cores and in the formation, *where it counts,* not in artificial filter paper tests.

# See why ALCOA ALUMINUM makes a good design habit

**Requirement:** strength without unnecessary weight plus superior corrosion resistance for world's first aluminum fly-in rig

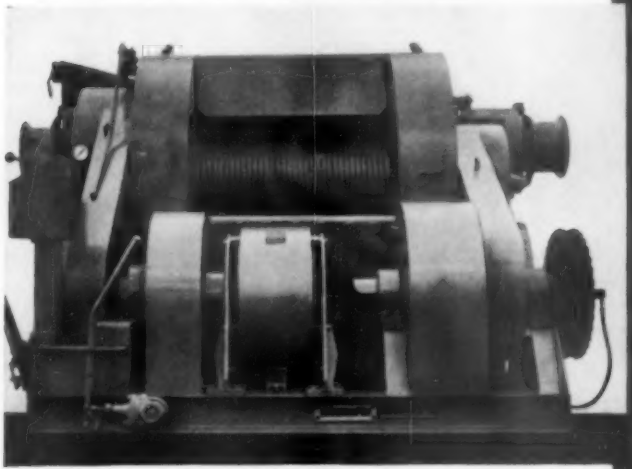
**Key to good design:** aluminum magnesium alloy 5456 developed by Alcoa

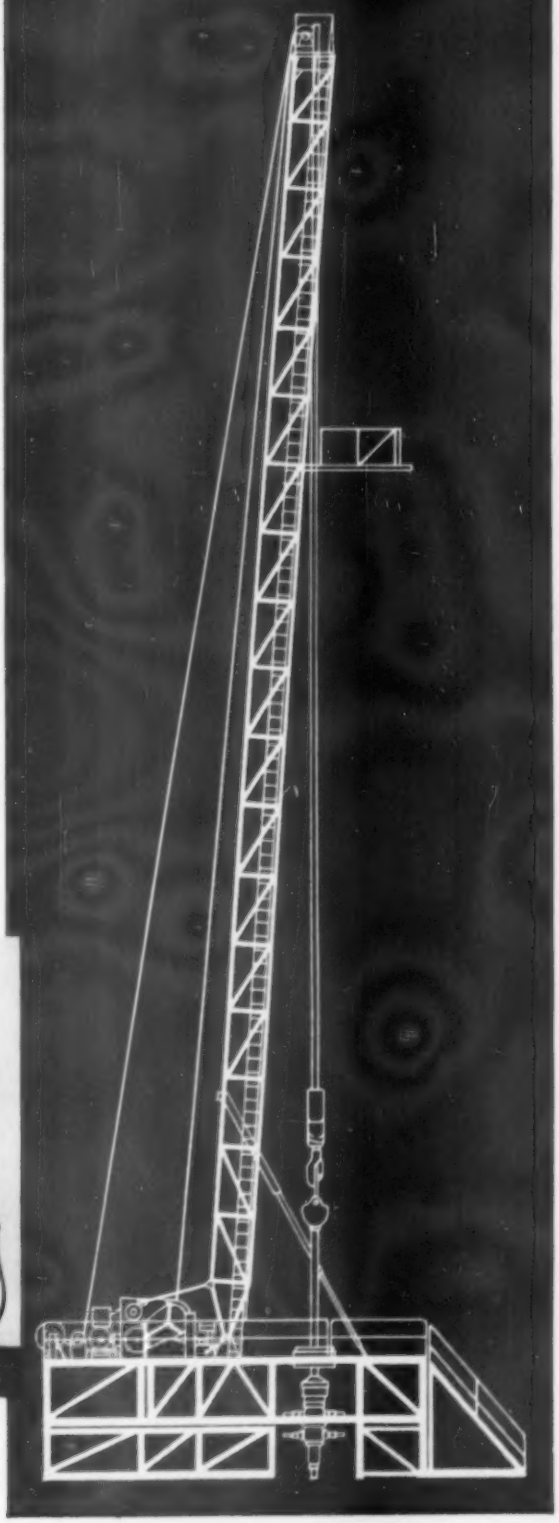
With tests in actual drilling muds, ALCOA engineers proved the superior corrosion resistance of aluminum magnesium alloy 5456 for use in the world's first aluminum fly-in drilling rig. And the excellent strength-weight ratio of this ALCOA®-developed alloy made it perfect for use in the subbase of a special Wagner Morehouse, Inc. draw works that forms the heart of the new rig.

The new rig makes extensive use of the light, strong, corrosion-resistant ALCOA-developed alloy throughout. The substructure is fabricated of aluminum structural members. A fabric mud tank employs an aluminum support frame. The suction tank and suction manifolding in the mud system are aluminum. And aluminum is used for a special shale shaker support and desanding ditch.

The new rig breaks down into 4,000-lb packages for easy helicopter transport. It will be used in hard-to-reach Central Bolivia—in a joint exploration program for Bolivia California Petroleum Co., a subsidiary of the Standard Oil Co. of California, and Compania Petrolera Boliviana Shell, Ltd., one of the Royal Dutch Shell group of companies. Loffland Brothers de Caracas C.A. is the drilling contractor.

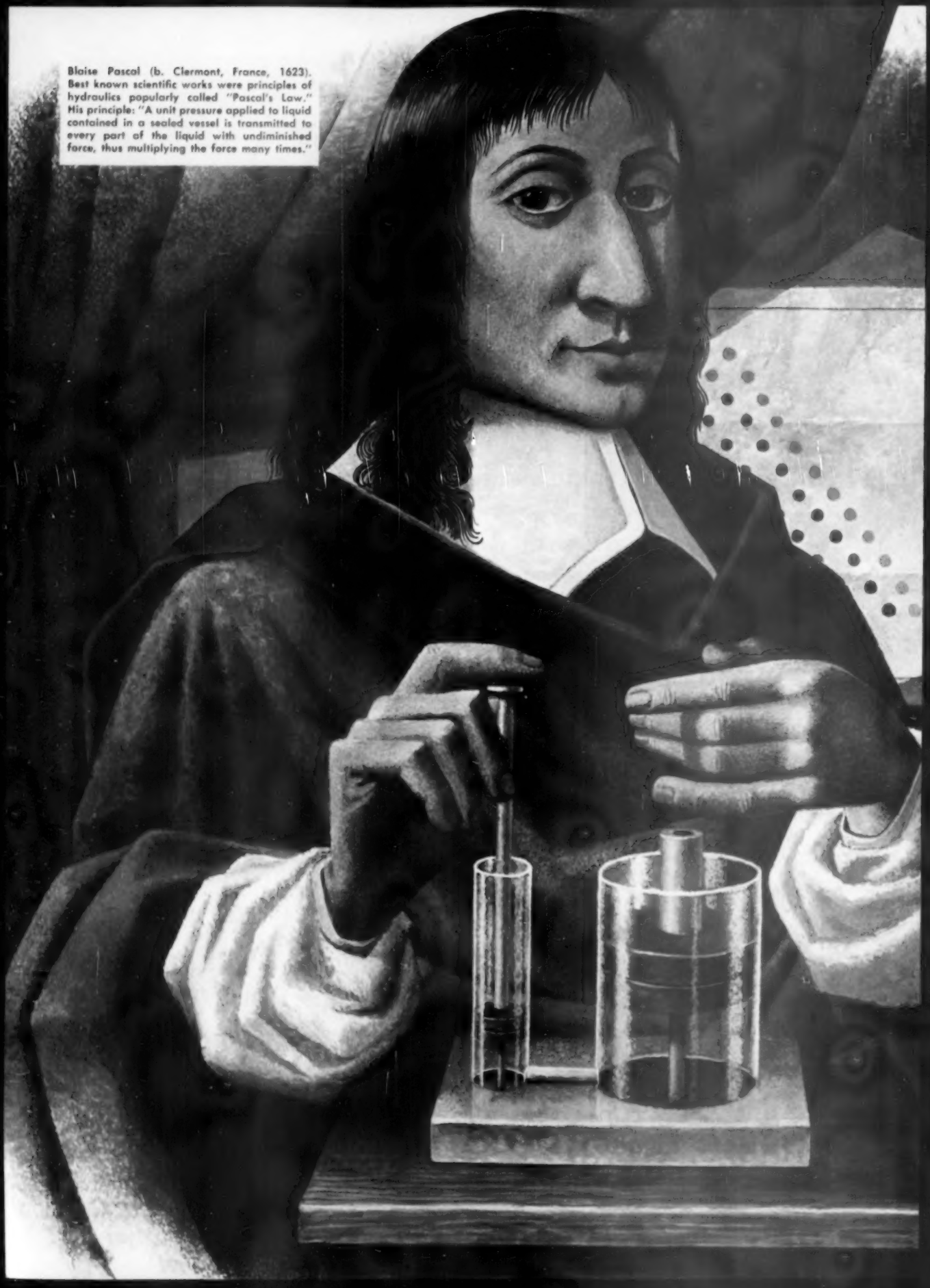
Here you see how ALCOA engineers apply over 40 years of petroleum experience to make aluminum the good design habit for the petroleum industry. ALCOA knows aluminum and knows oil and knows how you can put the two together for more profitable operation. Our file of process industries literature will suggest many ways aluminum can serve you. To get it, write ALUMINUM COMPANY OF AMERICA, 873-K Alcoa Building, Pittsburgh 19, Pa. World-wide sales through ALCOA INTERNATIONAL, INC., 230 Park Avenue, New York 17, N.Y.





ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA



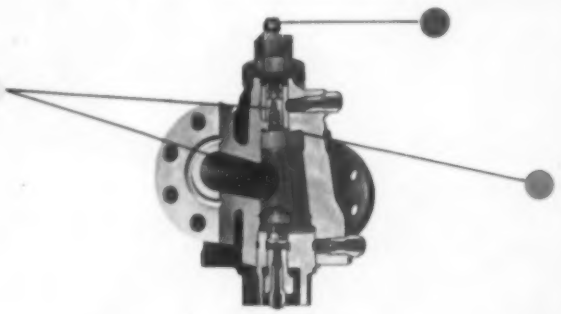
**Blaise Pascal** (b. Clermont, France, 1623). Best known scientific works were principles of hydraulics popularly called "Pascal's Law." His principle: "A unit pressure applied to liquid contained in a sealed vessel is transmitted to every part of the liquid with undiminished force, thus multiplying the force many times."

# he gave the world new muscles

## *. . . and his idea helped give you a better valve*

Blaise Pascal, through applied hydraulics, freed man from total dependence on his own muscles and the brute strength of animals. The list of modern devices that rely at least in part on hydraulics to multiply power is almost endless.

A perfect application of Pascal's principle is the Rockwell-Nordstrom lubricated plug valve. In it, *pressurized* lubricant jacks the tapered plug minutely from its seat to keep it free for instant ¼-turn operation. And pressurized lubricant in the Sealdport® grooves between the valve body and plug also creates powerful, positive seals against leakage . . . seals that can't be damaged like the exposed seats in other valves. For additional reasons why Rockwell-Nordstrom lubricated plug valves will give you better flow control at lower cost, examine the cutaway illustration below.



**PERFECT APPLICATION OF A PRINCIPLE**

- Lubricant quickly, easily injected through Rockwell fitting.
- Lubricant travels through Sealdport® system to create powerful seals against leakage and prevent metal-to-metal wear between plug and body . . . note seats never exposed to the line.
- Lubricant hydraulically jacks plug minutely from seat for instant quarter-turn operation.

Rockwell-Nordstrom is the original and world's most complete line of lubricated plug valves. Available in sizes from ½" to 36" and pressures to 15,000 lb. For additional information, see your supplier or write: Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania. Canadian Valve Licensee: Peacock Brothers Limited. If you live outside the USA, write: Rockwell International S.A., Geneva, Switzerland.

*Lubrication Makes The Difference*

ROCKWELL-Nordstrom VALVES

another fine product by

**ROCKWELL**

"The changes of the '50s will be dwarfed in the coming years . . . rockets will become commonplace; electronics will further revolutionize computation and automatic controls. Science has big breakthroughs in the test tubes and on the drawing boards. The people of the earth want more of everything, want it better, and want it soon."

—Leo D. Welch, Chairman of the Board

**Standard Oil Company (New Jersey)**

# Chemicals and Oil Are Cousins— But They Can't Be Treated Alike

*AMONG THE BASIC DIFFERENCES:*

- **Technology in the young petrochemical industry is changing rapidly, while oil technology is much closer to maturity.**
- **The petroleum industry makes mostly finished products; the chemical industry mostly intermediates.**
- **Plant investment per unit of output is much greater for chemicals than for oil.**

**An increasing number of oil companies are intensifying their efforts in the field of petrochemicals. And many are deciding that it takes a separate organization to develop, manufacture, and sell chemicals.**

Most recent among the major oil companies that have reorganized their chemical activities in order to give them added impetus, are Sunray Mid-Continent Oil Co. (PW—Aug.19'60, p72) and Socony Mobil Oil Co. (PW—Jun.24'60,p28).

Sunray Chemical Co. is a wholly owned subsidiary of the parent company.

Mobil Chemical Co. is an independent operating division within the corporate entity.

**Another method is a joint venture with a strictly chemical firm.** Many such joint ventures have been started in recent years. Among them: the alliance of Sinclair Refining Co. with Koppers Co.; of Richfield Oil Co. with Stauffer Chemical Co.; the formation of SunOlin and AviSun, joint ventures of Sun Oil Co. with Olin Mathieson Chemical Corp. and American Viscose Corp., respectively.

**Many of the companies that are now creating distinct petrochemical divisions have, for a long time, been handling a substantial amount of petrochemical production and sales as part of their regular refinery business.**

"Socony Mobil has sold as much as $90-million a year of petrochemicals," Paul V. Keyser, Jr., president of Mobil Chemical Co., told PETROLEUM WEEK last week. "But these products were largely produced as a result of circumstances which had little to do with the development of the petrochemical business as such.

"For example, we manufactured petroleum coke, and incidentally sold it, because, as net purchasers of crude within the U.S., the economics frequently favored coking as a refinery operation, with the production of increased quantities of gasoline and distillate fuels. We developed a substantial market for waxes and a wide variety of compounded wax products because the waxes were derivatives of our lubricant production. We reached an enviable position in the catalyst field because we had decided to make our own catalysts for use in refinery operations. Similar reasoning applies to our production of chemical additives for fuels and lubricants.

"Until recently, however, we never devoted substantial amounts of capital to the specific purpose of entering the petrochemical business. Now we have decided to make investments in petrochemical enterprises wherever, in our international operations, we find there is a good opportunity with a reasonable assurance of a satisfactory rate of return.

"Our chemical plants will be separate from our refineries, both physically and administratively. And our chemical developments may not remain tightly bound to hydrocarbon chemistry."

**Other oil companies recognized many years ago the need for an entirely separate chemical organization.** Among them: Shell Chemical Co. and Phillips Chemical Co.

Shell Chemical Co. was created over 30 years ago. Its president, Richard C. McCurdy, looks with some concern at the number of newcomers in the field, and hopes that they are aware of the serious responsibility that they are taking on.

"I only hope," McCurdy told PETROLEUM WEEK, "that the oil companies that are coming into the chemical business are doing it because they honestly like it, and not because they dislike temporarily what they have been doing. There is no more reason for a producer of hydrocarbons to go into the chemical business, if he doesn't sincerely like it, than there is for a shepherd to become a weaver of wool, unless he sincerely likes to be a weaver.

"There is fierce competition in the

**"I should like to be convinced that the interest of refiners in chemistry is genuine and will endure; that it will not be some sort of a 'seven-year itch'—or perhaps should I say a 'hundred-year itch'?"**

R. C. McCURDY
President, Shell Chemical Co.

**"I believe that our new organization will make a substantial and lasting contribution to the chemical industry, in the U.S. and abroad."**

PAUL V. KEYSER, JR.
President, Mobil Chemical Co.

# speaking

You are looking at the largest barge of its kind ever constructed. It is one of two independent pressure tank barges built by Avondale Shipyards, Inc., for the Union Texas Natural Gas Corporation of Tulsa, Oklahoma.

Measuring 273' x 41' x 12' 6", the open hopper barge contains four saddle mounted independent cargo tanks each 112' 9½" in length and 16' 3⅛" in diameter. Each pressure tank has liquid capacity of 165,000 gallons, for a total barge capacity of 660,000 gallons.

(Advertisement)


chemical industry, and it will take perseverance and a feeling of dedication to stay in. The newcomer must realize the importance of his responsibility to the industry. When a petroleum refiner suddenly decides to discontinue operations, this is hardly noticed. Motorists simply move on to the next service station. But should the producer of a specific petrochemical suspend his operations, the existence of those who depend upon his production to carry on their businesses may be seriously jeopardized."

A somewhat similar thought is expressed by Vincent Hurd, manager of technical development in Gulf Oil Corp.'s petrochemical department, when he says: "Gulf thinks that a lot of people now climbing on the bandwagon will either fall off or will find it more expedient to jump off, due to the petrochemical business."

**The need for a separate organization to carry out a company's petrochemical activities stems from basic differences between the oil business and the chemical business.**

This has not always been recognized.

"A common misconception is that chemical operations are similar to oil company operations," says Robert C. Gunness, executive vice-president of Standard Oil Co. (Ind.), the parent of Amoco Chemicals Corp. "We have found out in a sometimes painful fashion that this is not always true. We had to put together an experienced and knowledgeable manufacturing team."

**The differences between the two types of business are many. Some appear from the very beginning of a venture into petrochemical manufacturing.**

"Anyone who has money and feels so inclined can build a refinery," says J. E. Marsland, assistant to the executive vice-president of Shell Oil Co. "All he has to do is to get hold of an engineering firm—such as Universal Oil Products, M. W. Kellogg, or Lummus—and he will get a refinery with no danger of obsolescence for a long time to come.

"But not so for a chemical plant. The obsolescence rate is high; every new installation may differ radically from the last one that was built to make the same product."

How true that statement is can be verified by looking at the successive installations built in the U.S. within the past few months for the manufacture of acrylonitrile: Each manufacturer is using a different process, each claims that he can make the product better (PW—Sep.30'60,p39).

The same "step forward" is evident in the plants that are being built for the production of polypropylene.

In refineries, on the other hand, only minor differences can be noticed between two units built in succession for the same purpose.

**The sums that must be invested for the construction of petrochemical plants are much greater, per unit produced, than the sums required for the construction of petroleum refineries.**

Alvan H. Tenney, market research department manager of Union Carbide Chemicals Corp., estimates that the ratio is over 10-to-1.

And an increasing proportion of petrochemical output is represented by products which require more elaborate producing facilities. Dr. Robert L. Bateman, of UCC, estimates that, by the end of 1960, the capital investment in petrochemical plants will have reached $6-billion.

"Conversely," says H. E. Bramston-Cook, vice-president of the Oronite division of California Chemicals Co., "a high ratio of sales to investment is characteristic of new petrochemical

# of big bar

The hopper barges have a 32' forward rake section, an 8'6" after rake section, and are subdivided by watertight transverse bulkheads fore and aft of the tanks and in between each pair of tanks.

Each cargo tank was fabricated of 1-9/16" shell plating, cold rolled to 16'3⅛" diameter on the largest Bertsch plate roll of its kind in the Gulf South. The cylindrical sections were joined by automatic welding.

(Advertisement)


processes, due to the necessity of recovering promptly the greater outlay of capital."

**Closely related to the cost of chemical manufacture is the cost of chemical research: The sums devoted to it are proportionately several times greater than those spent on research in the oil industry.**

Those who are devoting large sums to research in the petrochemical field differ in their estimates; this is due to the fact that a certain portion of chemical research is basic, and thus can be accomplished by the parent oil company.

Several companies, however, indicate that they spend between 8% and 5% of their sales dollars in research. This ratio is at least three times as high as in the petroleum industry.

**Another major difference between the oil industry and the petrochemical industry is the market for which their products are intended.**

The petroleum industry manufactures essentially products that go, without further processing, to their ultimate consumers. Not so the petrochemical industry: By and large the products it manufactures are intermediates. They need further processing—frequently further chemical conversions—before they reach their final users.

One of the consequences is the creation of "captive markets" for petrochemicals. That is, manufacturers who depend on certain intermediates for their own production. The importance of captive markets, however, has decreased substantially in the past couple of years; many processors have a tendency to integrate upward, toward the production of the intermediates they need. They are also taking advantage of the stiffer competition between producers of petrochemicals to acquire more independence.

**A further—and significant—difference between the oil industry and the petrochemical industry is in the methods of their market research.**

Although the product marketed by a petrochemical company may be an intermediate, the objects that will ultimately be manufactured with it are of prime interest to the company; it is upon their ready acceptance, their diversification, and the growth in their utilization that any increase in demand for the initial raw material will depend.

**The creation by oil companies of new petrochemical divisions appears to have had good results to date.**

Most of them agree that profits derived from their petrochemical ventures have been gratifying.

They also agree that there is no significant overproduction of any petrochemical item—despite some overcapacity in several areas.

**There are several pitfalls that must be avoided.** Among them:

- Competition with one's own customers. As petrochemical companies integrate further away from raw materials, such cases are bound to occur.
- Price breakdown of certain products. This may lead to a price war—similar to those in gasoline marketing—if the particular chemical involved, like gasoline, has little or no price elasticity.

Alvan H. Tenney, of UCC, puts it this way: "When a chemical has no 'price elasticity,' when a price reduction does not lead to any increase in consumption, such a reduction is of no benefit to the industry. But when a reduction in price leads to a substantial increase in demand, either as a result of intensified usage or of new applications, then a lower price can be a definite advantage."

# ges...

Certified for the transportation of liquified petroleum of 250 PSI on the Inland Waterways, and classified A-1 pressure tank barges for river service, the contract completion is an excellent example of Avondale Shipyards' fabricating abilities.

The economies being effected today through the movement of petrochemical products by water are of prime profit importance. And important to your expansion into this area is the selection of a barge builder. Avondale Shipyards offers years of specialized experience, complete design, engineering and fabricating facilities, proof of ability through the hundreds of highly successful Avondale-built petrochemical barges now operating for many companies.

Cold rolling 1-9/16" steel plate to form a 16' 3⅛" dia. pressure tank section. Bertsch roll capacity is 4½", largest of kind in Gulf-South.

Tank sections being fabricated in one of Avondale's structural shops.

Foreground, pressure tank nearing completion on aligning platten, background, left, completed tank being stressed relieved in Avondale's 18' x 18' unlimited length stress relieving furnace.

One of four 165,000 gallon cargo tanks being lowered into saddles in barge hull. Lifting device (not shown) has 600-ton capacity.

**AVONDALE SHIPYARDS, INC.**

FORMERLY AVONDALE MARINE WAYS, INC.

P. O. BOX 1030 • PHONE UNiversity 6-4561 • NEW ORLEANS 8, U.S.A.

# Using Little Explosions To Tame Big Explosions

**An explosion protection system that reacts instantaneously to sense an incipient explosion and render it harmless is now available for use in refineries and processing plants.**

It is called Fenwal Explosion Protection, and is based on a British World War II development, which was designed to prevent explosions in aircraft hit by incendiary shells.

After the war, Graviner Mfg. Co., Ltd., adapted it successfully for industrial use in Great Britain. Fenwal, Inc., of Ashland, Mass., has obtained the exclusive manufacturing and sales rights for the U.S. and Canada.

The National Fire Protection Assn. estimates that the annual losses in U.S. industry caused directly by explosions, or as the result of explosion-triggered accidents, amount to about $100-million.

**The system makes use of the infinitesimal lapse of time that exists between the ignition of a blast and the buildup of its destructive pressure.**

This lapse is measured in thousandths of a second, and cannot be detected by the human eye. The eye does not react to periods shorter than 0.1 second.

But very sensitive instruments, Fenwal says, can sense the initial pressure buildup, or the first flash of a flame, and immediately put into action a combination of features that render the blast harmless.

**The protecting devices that constitute the system, called Fenwal Explosion Protection System, are actuated by explosive detonators.**

For rapid operation, blasting caps, somewhat similar to the precision caps used in seismic exploration, are made to open or close gates, release suppressant liquids, and break windows. The pressure insures that fragments fly outwards, away from the protected zone.

Thus detonations are actually helpful in taming incipient explosions.

**The heart of the system is the explosion detector. The various protection devices that it puts into motion are operated at ultrafast speed.**

The detector, according to its location in the plant, can be either a pressure or a radiation device (diagram). Radiation detectors, Fenwal says, are designed to sense selectively certain wave lengths of the spectrum which exist in an explosion flame, but to reject others present in natural or artificial light, so as to eliminate potential false alarms.

The protection devices consist of:

- Suppressing devices, which instantaneously and explosively envelop the incipient explosion with a liquid suppressant. The most common of these is a mixture of water and bromochloromethane in a fine spray moving at 600 ft. per sec.
- Venting devices, such as light windows that break to open a path to the atmosphere and relieve the pressure.
- Advance inerting devices, which introduce a suppressant into areas remote from the incipient explosion, to prevent secondary explosions or fires.
- Isolation devices, to contain the explosion within a restricted area.
- Automatic plant or equipment shutdown, when this is necessary.

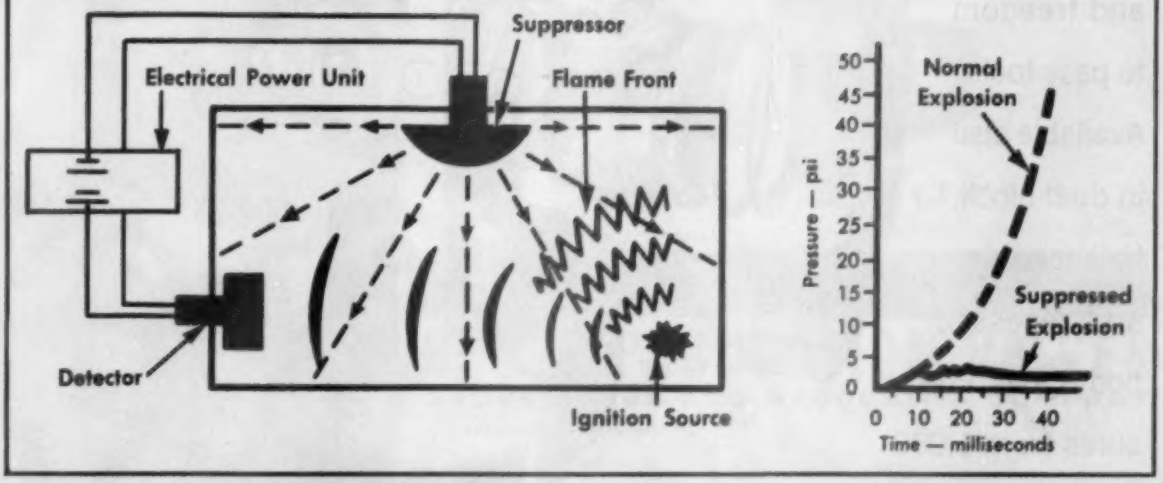
**The Fenwal system has been tested in the U.S. for several years.**

Fenwal has been testing the system at a secluded test site near Framingham, Mass. This center is believed to be the only one of its kind in the U.S., the company says. Special explosion chambers (picture) and highspeed electronic instruments are used. Highspeed motion pictures of actual explosions have given graphic evidence of the effectiveness of the system.

**Eight plants in the U.S. have installed the Fenwal system so far.**

At a recent demonstration of the system in New York, Clay Hammond, engineering superintendent in the Plastics Division of Monsanto Chemical Co., Springfield, Mass., described how the system had effectively suppressed an explosion in that company's polystyrene grinding plant this year. The only evidence of the explosion was given when the process shut down automatically.

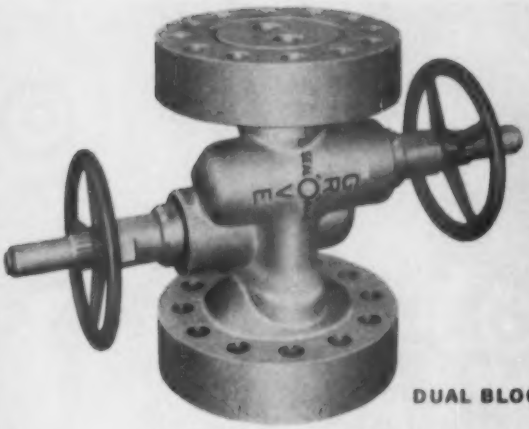
## How the Basic Suppression System Works



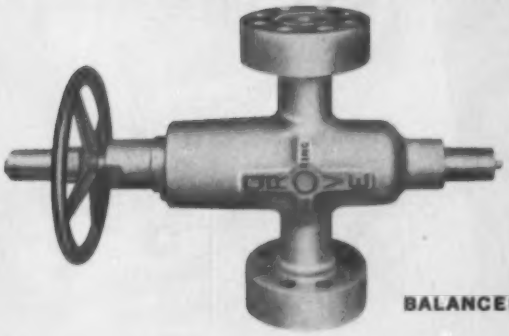

WHEN AN EXPLOSION IS THREATENED, the detector senses it, and activates the suppressor, which disperses a suppressing agent explosively. The chart (right) shows the comparison between a normal explosion curve and a suppressed one.

Dependability is engineered into Grove G-2 production valves. Proved double sealing assures positive shut-off. Metal-to-metal seal is provided by the action of parallel sided gate (1) against precision ground metal inner seat rings. (2) Protected nitrile rubber o-rings (3) back up the metal-to-metal seal and keep the gate clean and smooth by squeegee action. Seal is positive on both sides of the gate. (4) No lubricants or sealing compounds are needed. Round, smooth, through conduit opening (5) assures ideal flow characteristics and freedom to pass tools. Available also in dual block, balanced stem and recessed body types. Pressures from 1,000 to 10,000 # w. o. g.

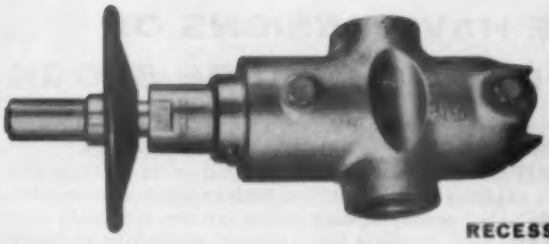
# GROVE G-2 SEAL-"O"-RING® GATE VALVES FOR PRODUCTION AND FLOW LINE SERVICE



DUAL BLOCK



BALANCED STEM



RECESSED BODY

## GROVE PRODUCTION VALVES

**GROVE VALVE AND REGULATOR COMPANY**

a subsidiary of Walworth

Oakland 8, California

*Offices throughout the U.S. and in Western Canada*

## WE HAVE DESIGNS ON EVERYBODY'S CHARGE STOCK

Serving processors who want high yields of high octane gasoline begins at Houdry, with three efficient and flexible catalytic processes.

The HOUDRIFLOW Process accepts in liquid or vapor form any fraction between naphtha and asphalt from both sweet and sour crudes. In the HOUDRESID Process, reduced crudes are converted into high octane gasoline and light distillate fuel—without production of heavy residual fuel.

Straight-run and cracked petroleum naphthas are converted to high octane gasoline, blending stocks, and aromatics by the efficient HOUDRIFORMING and ISO-PLUS HOUDRIFORMING Processes.

Complementing these processes, Houdry also offers catalysts, technical service, engineering, research, and economic consultation.

Write, outlining your interests or requirements, for a full description of specific ways Houdry may be able to serve you.

*HOUDRY

PROCESS CORPORATION
1528 Walnut Street, Philadelphia 2, Pa.
*Houdry means Progress...through Catalysis

# What's New

## IN PROCESSING

**As predicted, the largest crude still in the world, the No. 12 still of Standard Oil Co. (Ind.) at Whiting, will soon go on full closed-loop computer control** (PW—Oct.14'60,p39).

Operation of this 140,000 b/d still is at present being optimized with the help of an IBM 740 computer. International Business Machines Corp. will deliver the new, on-line process-control computer early in 1961.

•

**A Thompson Ramo Wooldridge RW-300 digital computer will be the first closed-loop computer to be installed in a chemical plant outside the United States.**

The system will control an undisclosed process at the Ludwigshafen am Rhein plant of Badische Anilin-und-Soda Fabrik AG, West Germany's second-largest chemical company.

TRW Computers Co., a division of Thompson Ramo Wooldridge, Inc., produced the system at its Denver plant; installation is slated for this year.

The parent company plans to rent or sell other RW-300s in the European Common Market through a subsidiary it has formed with two French companies.

•

**Three UOP Merox units have gone on stream at Standard Oil Co. (Ohio) refineries—one at Toledo, and two at Cleveland.**

Universal Oil Products Co. says the 12,000 b/d unit at Toledo is one of the largest applications of the process in operation to date. It is being used for sweetening light catalytic gasoline.

At the No. 1 refinery at Cleveland, one Merox unit is sweetening 1,000 b/d of light catalytic gasoline, and the other is extracting mercaptans from between 500 and 7,100 b/d of mixed butanes, depending on seasonal demand.

•

**A $17-million petrochemical complex will be constructed at the Richmond refinery of Standard Oil Co. of California.** Completion is expected by late 1961 or early the following year.

Capacity for paraxylene production at the complex will be 41-million lb. per year, and 100-million lb. per year for high purity orthoxylene.

# INTEGRATED PERFORMANCE ...BUILT IN!

On your next contract for construction of a new or expanded process facility, what will you expect in return for the dollars you invest?

For a better-than-average return you can depend on Procon. For Procon gives you this important extra:

From start to finish . . . through estimating, engineering, purchasing, construction, inspection . . . Procon personnel keep an eye on the big objective. Not only must each part of the job be built for perfect performance, but it must also function superbly with every other part. All must work together as a well-knit, fully integrated unit.

Only thus can you be assured of what you really want . . . a completed plant that gives you *maximum production with minimum overhead.*

**PROCON INCORPORATED**
1111 MT. PROSPECT ROAD,
DES PLAINES, ILLINOIS, U. S. A.

PROCON INTERNATIONAL S. A.,
CHICAGO, ILL., U. S. A.

PROCON (CANADA) LIMITED,
TORONTO, CANADA

PROCON (GREAT BRITAIN) LIMITED,
LONDON, ENGLAND

PROCON PTY. LIMITED,
SYDNEY, AUSTRALIA

PROCOFRANCE S. A. R. L.,
PARIS, FRANCE

PROCON LIMITADA,
SAO PAULO, BRAZIL

VICAPROCON, S. A.,
CARACAS, VENEZUELA

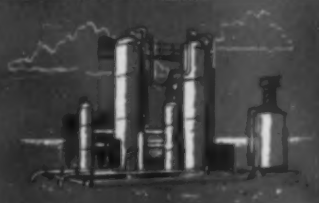
PROCON

**PROCON** *Incorporated*

WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL AND CHEMICAL INDUSTRIES

# PROOF OF PERFORMANCE

## CUSTOMERS REPORT QUICK COMPLETIONS, QUICK PROFITS, QUICK PAYOUT with PARKERSBURG DAU'S*



**PROOF POSITIVE from the Texas Gulf Coast**

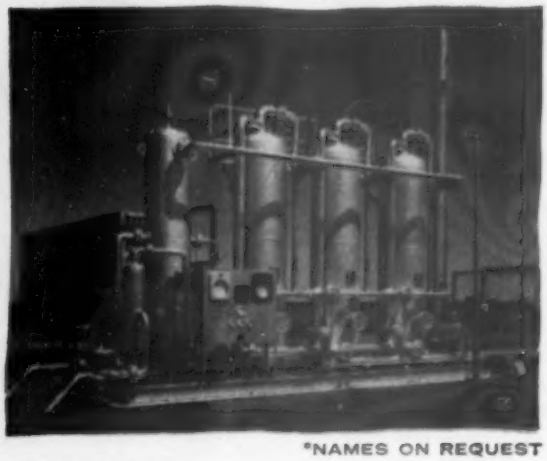
A 36" x 15' two-tower DAU was delivered in the field and assembled that same day... tied into the pipeline the following morning... turned on stream that afternoon. Now processes 5 million feet of gas, recovers 25 barrels per day. **Proof positive** that a DAU goes to work faster—produces profits **quicker.**

**PROOF POSITIVE from South Texas**

A 20" three-tower DAU was assembled and put on stream within 36 hours... now processes 4 million feet of gas per day. Proof positive that Parkersburg's **precision** pre-engineering and complete test assembly of DAU units in the plant enables quicker **completions,** maximum efficiency of operation.

**PROOF POSITIVE from offshore Louisiana**

On a small offshore platform where space is limited, but the job is big (18 million feet of gas to process), three 16" DAU's were installed... now provide quick, dependable dehydration, resulting in more salable pipeline gas in less time. **Proof positive** that there's a Parkersburg DAU for every hydrocarbon recovery and/or dehydration job.



*NAMES ON REQUEST

**WHEN YOU BUY PARKERSBURG YOU GET 'EM ALL!**

**ENGINEERING** . . . Parkersburg patents the process, not just the equipment.

**MANUFACTURING** . . . Parkersburg units are backed by rigid systems of quality control.

**INSTALLATION** . . . Parkersburg equipment installations are supervised by experts.

**SERVICING** . . . Parkersburg trains your men, services your unit any time, anywhere.

*SEE YOUR PARKERSBURG MAN TODAY!*

THE PARKERSBURG RIG & REEL COMPANY
Division of Parkersburg-Aetna Corp.
PARKERSBURG • HOUSTON • COFFEYVILLE

**PARKERSBURG—The FULL LINE in Pressure Vessels . . .** Separators, Metering Equipment, Treaters, Heaters, Knockouts and Oil Skimmers, Scrubbers, Hyrecos, Hydrocarbon Recovery Units, Glycol Dehydrators, Stabilizers.

# French State Firms to Refine Abroad

*(A Report from* PETROLEUM WEEK'S *Paris Bureau)*

**PARIS—French government-controlled producing companies may soon be refining Sahara crude in Belgium — and marketing products there, in West Germany, and in the Netherlands,** according to reliable Paris sources.

This acquisition of a marketing and refining stake in the neighboring countries—all, like France, part of Europe's Common Market—would be a new coup for France's fast-growing state oil interests.

With substantial crude resources in Algeria, France has often eyed its neighbors as potential customers for its government-controlled production.

**S.N. Repal and Regie Autonome des Petroles (RAP) are completing a deal to rent the 14,000 b/d Albatros refinery, at Antwerp, for from 5 to 15 years,** it is reported here.

The firms, which expect to begin refining operations in Belgium by the end of the year, would each take half of the output. A preliminary agreement has already been approved, Paris sources say, and a final contract is expected to be signed soon.

The Albatros refinery is equipped with topping and catalytic cracking units. It is owned 18% by Manchester Oil Refinery (Holdings), Ltd., of London, and the remainder by private Belgian and French stockholders and banks.

S.N. Repal owns 50% of the production of the Hassi Messaoud field in Algeria, biggest discovered there to date. RAP holds a 51% interest in Creps, whose Zarzaitine and Edjele fields near Libya recently went into production for export (PW—Oct.14 '60,p48).

**The Belgian refining interests will be in addition to the initial refining stakes the two firms already have in France.**

RAP and S.N. Repal each hold one-third interests in the Union Generale des Petroles, to which Caltex sold a 60% interest in its French properties earlier this year.

The other third of UGP is held by a group of four other government-controlled producers.

RAP and S.N. Repal have also tied up other French refiners to contracts for Sahara crude, insuring the sale of virtually all their oil this year and about 80% next year.

# Outlook Dims for French Export Plants

**PARIS—Two groups of companies with plans for "Common Market" refineries at Strasbourg, in northeastern France, appear to be having second thoughts about them.**

The two refineries were first proposed nearly three years ago with an eye on markets in eastern France, southern Germany (including Bavaria), and Switzerland. One is a project of Shell, Mobil, and Caltex; the other of British Petroleum and two French refiners.

**With two additional refineries projected for Karlsruhe, in southern Germany, they would form an entirely new refining nucleus** in industrial regions on both the French and German sides of the Rhine.

One of the Karlsruhe refineries will be a 65,000-80,000 b/d Esso plant. The other will be a 40,000-60,000 b/d unit owned by Mobil and four German companies.

The refining companies set up to build the two plants at Strasbourg have started preliminary site preparation, but plans to proceed with construction have been delayed by "problems"—including the question of capacity in fast-changing circumstances.

**The French government's insistence that refiners in France buy high-priced Sahara crude is seen as one reason for delays in the Strasbourg refining plans by well-informed circles in Paris.**

These sources point out that the country with the lowest-priced product will be in the best position within the six-nation Common Market when import quotas the countries are now gradually whittling down are eventually abolished.

**Thus, as a result of French policy, refiners within France will be at a disadvantage in the Common Market,** compared with refiners in other countries in the bloc that are free to buy lower-priced crude.

This is one reason why refiners in Strasbourg might not find the markets they were counting on originally, Paris sources say.

**In addition, further refining plans have been evolving in some of the potential markets for the projected refineries.**

In Switzerland, one plant is slated for construction by mid-1962 by Italian-Swiss interests.

And in south Germany's Bavaria, several proposals have already been made—by Italy's state-owned ENI, Shell, and Esso—with prospects of more to come. Even in eastern France, a plan by Omnium Francaise des Petroles to build a refinery near Dijon is reportedly again being considered, after it was turned down by the government two years ago.

**Delays on the two Strasbourg refinery plans have stirred speculation that they may be completely overhauled—or possibly dropped entirely**—though neither company will talk about its intentions.

Originally, a 60,000 b/d plant was planned—with the Bavarian market as one of its targets—by Raffinerie de Strasbourg, owned ⅓ each by BP, Cie. Francaise de Raffinage, and An-

tar, another French refiner. Now the participants are no longer certain of the capacity they will need.

The other refinery was originally planned for 70,000-80,000 b/d by Cie. Rhenane de Raffinage, owned 85% by Shell-Berre, 5% by Mobil SAF, and 10% by Caltex SAF.

Disposition of the Caltex share in this firm apparently is one of the stumbling blocks. It is expected to be taken over—along with other Caltex interests in France—by Union Industrielle des Petroles, recently formed by Caltex and the government-controlled producers to whom it sold a 60% interest in its French properties.

Shell reportedly insists that UNIP's interest in the Strasbourg refinery must not be raised when its capitalization is increased—or else the whole project would be dropped.

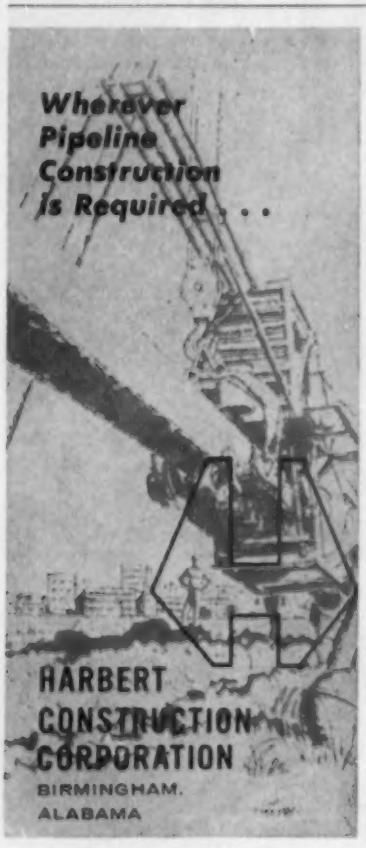
Under one compromise that may be made, UNIP would continue to hold a 10% interest in the plant and its refining capacity—but could ask Shell and Mobil to refine a further 5% under a processing agreement.

**Meanwhile, a 16-company group still expects to start construction next summer of a 34-in. pipeline to carry crude from the Mediterranean to the four refineries at Strasbourg and Karlsruhe** (PW—Oct.23'59,p46).

The 466-mi. pipeline, starting at Lavera, near Marseilles, will be built by the multicompany South European Pipeline Co., which is awaiting a French government decree, expected next month, declaring the line a public utility so that it can start land expropriation. In the meantime, it is winding up negotiations for land near Lavera where it will put up over 35-million cu.ft. of tankage.

The pipeline is slated to go on stream in January, 1963, with initial capacity of 200,000 b/d, to be raised progressively to 600,000 b/d.

**Eight of the participants in this line recently submitted a formal proposal to Germany for a 21.6-in. extension into Bavaria** from Karlsruhe (PW—Sep.16'60,p20). Initial capacity of the 150-mi. spur would be 80,000-100,000 b/d with one pumping station, with a "considerable" expansion possible with more. Participants in this extension: BP, Shell, Esso, Mobil, and four German companies.




# Asia Refining Plans Are Shifting

**New refining plans are emerging in Southeast Asia—in both Vietnam and Thailand—replacing U.S. bids recently dropped,** according to reports from Saigon and Bangkok last week.

In Vietnam, the government has rejected a proposal made earlier this year by the U.S.-backed Sterling Oil Co., well-informed sources in Saigon said. Sterling was a new company organized by U.S. Summit Corp., of New York, with the backing of Phillips Petroleum.

And in Thailand, Indiana Standard recently withdrew its proposal for a 25,000 b/d refinery which it would have turned over to the government after ten years (PW—Sep.30'60,p34).

**In Vietnam, Stanvac and Shell have jointly submitted a formal proposal to build a 22,000 b/d refinery** costing about $15-million.

Both companies are established marketers there. So is Caltex, but it is not participating in the refinery proposal.

**In Thailand, the government said it is now considering expansion of a projected small Defense Ministry plant**—following what it called Indiana Standard's "unfair" move in withdrawing its bid, selected "only after long study."

The Industry Minister said the 5,000 b/d capacity of a projected Defense Ministry refinery could be increased to 20,000 b/d, which, he said, would be enough for Thailand's needs. The plant, now on the drawing board, will be financed and built by the Japanese-owned Fuji Car Co. with support of a private French bank.

**The Thai government has also authorized the Industry Ministry to consider any new refinery proposals.**

Shell, Stanvac, and Caltex—all established marketers there—long ago submitted proposals for a joint refinery.

They're still interested, but are now awaiting a request from the government to submit a new plan.

# Italy O.K.'s 23% Refining Boost

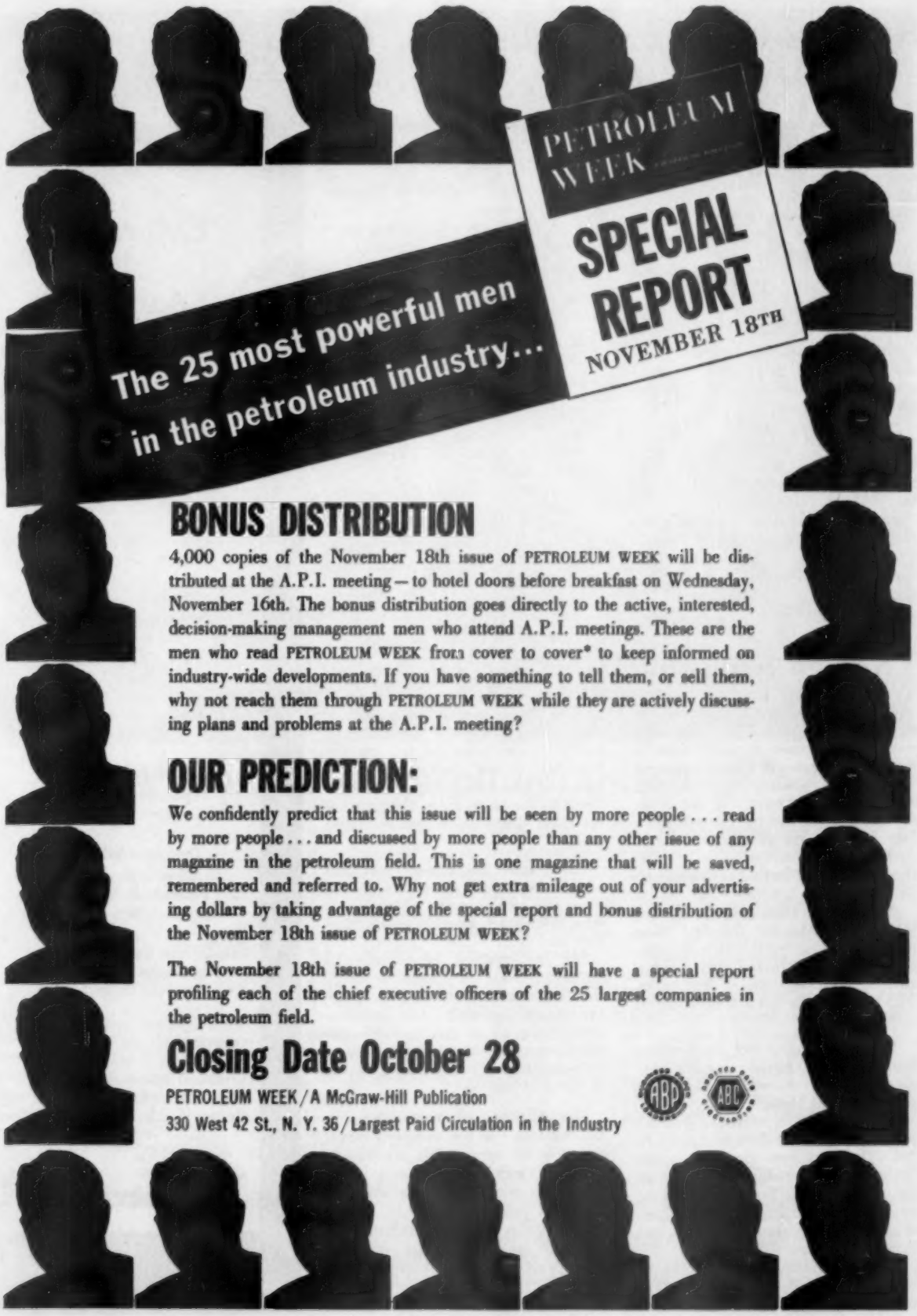
**Italy's 600,000 b/d refining capacity—about 40% of it devoted to production for export—is slated for a 23% boost.**

Present capacity is in almost full use, including a 30% reserve required by law. The Italian government has now authorized the addition of 136,000 b/d of capacity to existing plants, while further applications are pending.

Excluding the 30% reserve, this will add over 100,000 b/d to the operable capacity of seven refineries.

**The biggest single share of the expansion has been authorized for Stanic, a joint affiliate of Jersey Standard and Italy's state-owned ENI,** which will add 42,000 b/d to its Bari plant to boost operable capacity to 70,000 b/d.

The independent Sarom will add 30,000 b/d for a total of 50,000 b/d at Ravenna. Shell's plant at Milan will be boosted 10,000 b/d to 38,000 b/d. The Milan plant owned by Cie. Francaise des Petroles will more than double to 18,000 b/d by addition of 9,500 b/d. The British Petroleum-ENI Marghera refinery will add 6,300 b/d for a total of 34,000 b/d. Garrone, an independent, will add 3,000 b/d at Genoa for a total of 30,000 b/d; and Petrofina's small Milan plant will be boosted by 2,800 b/d to 4,400 b/d.




## BONUS DISTRIBUTION

4,000 copies of the November 18th issue of PETROLEUM WEEK will be distributed at the A.P.I. meeting — to hotel doors before breakfast on Wednesday, November 16th. The bonus distribution goes directly to the active, interested, decision-making management men who attend A.P.I. meetings. These are the men who read PETROLEUM WEEK from cover to cover* to keep informed on industry-wide developments. If you have something to tell them, or sell them, why not reach them through PETROLEUM WEEK while they are actively discussing plans and problems at the A.P.I. meeting?

## OUR PREDICTION:

We confidently predict that this issue will be seen by more people . . . read by more people . . . and discussed by more people than any other issue of any magazine in the petroleum field. This is one magazine that will be saved, remembered and referred to. Why not get extra mileage out of your advertising dollars by taking advantage of the special report and bonus distribution of the November 18th issue of PETROLEUM WEEK?

The November 18th issue of PETROLEUM WEEK will have a special report profiling each of the chief executive officers of the 25 largest companies in the petroleum field.

## Closing Date October 28

PETROLEUM WEEK / A McGraw-Hill Publication
330 West 42 St., N. Y. 36 / Largest Paid Circulation in the Industry

# Russian Gasoline Smells, So . . . Caltex Gets Chance in Cyprus

**NICOSIA—Consumer dissatisfaction with "smelly" Russian gasoline has given Caltex a chance to put its foot in the door of the Cyprus market—through a local marketing firm.**

Caltex products, mainly fuel oil and gasoline, are now being sold by Petrolina, the only national marketing firm in this newly independent island republic (PW—Feb.12'60,p42). The firm is owned by Lafarides Brothers, a Greek Cypriot transport outfit.

**The local company stopped dealing in Black Sea products after several large shipments of products were already distributed.**

Oil marketing sources said the move followed complaints by customers that Russian gasoline was "too smelly" and below the advertised octane rating.

Service station attendants reported that, on occasion, motorists drove into their stations and asked to have the Russian gasoline pumped out of their tanks.

Before shifting to Caltex products, Petrolina tried marketing Italian products, sold under its own name.

**Caltex, which now has an operating arrangement with the local company, is negotiating for a long-term agreement.**

Under the proposed agreement, Petrolina would distribute a wide range of Caltex products, including lubricants, under the Petrolina brand.

**Meanwhile, the local firm is moving fast to capture an important share of the local market from Shell, Esso, and Mobil.**

Marketing sources in Cyprus say Petrolina now holds from 10% to 12% of the market, thanks largely to its promotion of its position as the country's only nationally owned oil company.

Starting with ten stations early this year, Petrolina has built its system to 30 outlets. Six more are being built.

The company is aiming to capture 15% of the market.

# Tanker Surplus Hurting Tapline

**BEIRUT—Tapline's throughput is scraping along at 50.3% of capacity—and a big cause of the trouble is the current surplus in tanker tonnage.**

In a paper called "Pipeline Economics and Technology in the Middle East," presented by Trans-Arabian Pipe Line Co. this week to the Second Arab Petroleum Congress, in Beirut, the company set forth some details of its problem.

An index of the difficulty is the throughput rate for the first nine months of 1960—231,981 b/d. This compares with 316,413 b/d for the same period last year, a decline of 32.3%. The line has a total capacity of 460,000 b/d.

**Tapline is facing stiff competition from the bigger tankers available today because of the present depressed tanker freight rates.**

This is so even though Tapline provides a direct, shorter land route to the Mediterranean Sea for Saudi Arabian crude produced by Arabian American Oil Co. Tankers picking up crude in the Persian Gulf must haul it around the Arabian Peninsula and through the Suez Canal.

The larger tankers available today "have radically reduced the cost of oil transport," according to the report. "They can be operated by essentially the same number of men as the smaller ships, reducing the cost of labor per barrel." Initial capital investment per ton of capacity is also lower on the larger ships, thus making for lower depreciation and insurance rates.

**The present low tanker rates also enable buyers of oil to weigh the economic attractiveness of buying oil from different producing areas,** Tapline said.

"In the selection of a particular source of crude oil supply to satisfy the demands of a marketing area," the report declared, "the delivered cost of the oil at the market is the prime consideration, and the costs of transportation are an important part of the delivered cost."

**The imposition of "excessive financial burdens" on the company would put it in an unfavorable position to compete with tankers, and could make it a marginal source of transport,** the paper said.

Tapeline is locked in a debate with the four countries through which it moves oil over the question of higher transit fees, which would increase the costs of transporting oil.


Interested personal service—
always—
when you buy from Eastman

**Eastman Gasoline Additives**

**Tenamene 1**
An aminophenol. Low cost, efficient gum inhibitor for motor fuel.

**Tenamene 2**
A phenylenediamine. A versatile gum inhibitor for motor fuels and aviation gasolines. Also acts as a sweetening agent in many catalytically cracked stocks.

**Tenamene 3**
An alkylated phenol. Efficient gum inhibitor for motor fuels, aviation gasolines and jet fuels.

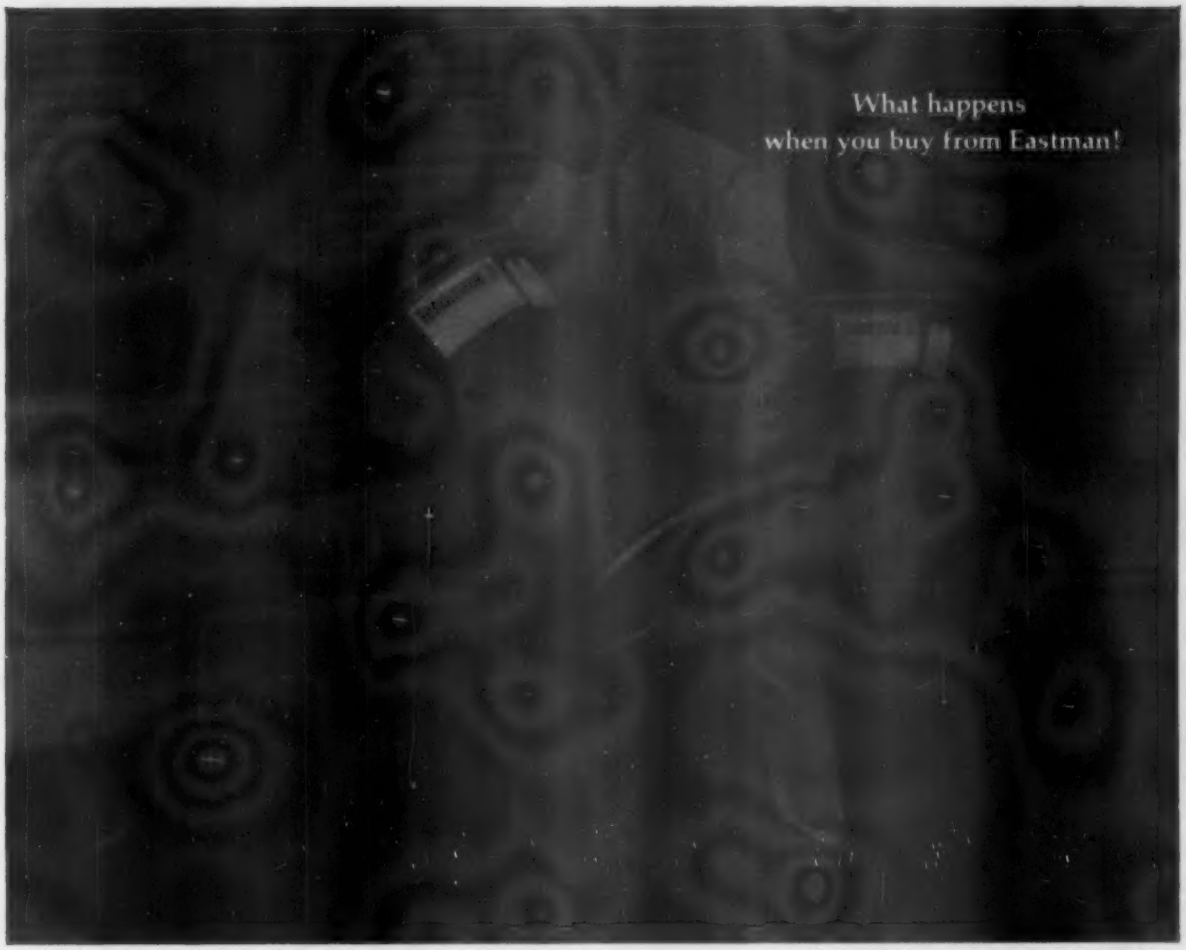
**Tenamene 60**
A powerful copper deactivator.

**Tenamene MD 50**
A freeze-resistant solution containing copper deactivator.

For information on how to use Tenamene gasoline additives, send for Bulletin I-106.

For properties and shipping information on these and other Eastman products, see **Chemical Materials Catalog**, page 395, or **Chemical Week Buyers' Guide**, page 107.

**Eastman**




# "A trunkful of gasoline inhibitor..."

"That's what he said," reports one of our sales representatives—"trunkful. And after removing fishing gear, debris from last year's vacation, plus my spare tire, that's what he got, in the form of two drums of Tenamene 3.

"The first part of the purchasing agent's late evening call was a soliloquy on the aberrations of suppliers in general. I agreed that a supplier who confused ditertiary butyl_____ (name withheld to protect the innocent) with ditertiary buty cresol (Tenamene 3*) was a bit loose in the order-writing department. At the same time I was quietly glad that we do not sell the ditertiary butyl derivative of _____. It can happen, you know.

"Anyway that's what had happened. When they were ready to stabilize a run of aviation gasoline, a sharp foreman stopped the operation before the gasoline was adulterated rather than stabilized, since as a gasoline inhibitor the _____ derivative, being insoluble, doesn't even so much as contact the problem.

"To keep gum formation from getting a head start, I went out to our local warehouse at 4:30 A.M., loaded two 100-pound drums of flake Tenamene 3 in the trunk of my car, and took off with a little prayer that there were no loose nails in the road.

"There weren't, and I arrived at the customer's refinery at 9:00 A.M."

Normally, we move Tenamene inhibitor around the country by rail freight or truck transport. If possible we'd like to continue this practice. In an emergency, however, we're prepared to give our customers maximum personal service.

**Sometimes, this personal service even includes personal delivery.**

*Eastman's gasoline inhibitor grade of 2,6-ditertiary butyl p-cresol.

**Eastman** CHEMICAL PRODUCTS, INC., KINGSPORT, TENNESSEE, Subsidiary of Eastman Kodak Company

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee, Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Greensboro, North Carolina, Houston, Kansas City, Missouri, New York City, Philadelphia, St. Louis.
West Coast: Wilson & Geo. Meyer & Company, San Francisco, Los Angeles, Portland, Salt Lake City, Seattle.

# What's New / AROUND THE WORLD

## Mobil, ENI Vie For Ghana Refining

**GHANA—Socony Mobil and ENI, the Italian state oil agency, are vying for the first refining rights here—the latter reportedly to handle Russian crude.**

Both companies last week confirmed reports that they have submitted proposals to build refineries, but no details were available from either. A decision is expected by the end of 1960.

•

**VENEZUELA—Official oil policy "does not permit" exports of Venezuelan oil outside the limits of its "natural" markets, the Oil Ministry says.**

The statement appears in its weekly bulletin in a comment on the anticipated visit of a Japanese industrialist who foresees the need for large volumes of oil for his company's thermoelectric plants in Japan.

•

**IRAQ—The Oil Ministry has appointed a new Director General of Oil Affairs,** a post previously filled in an acting capacity by the Director General of the Planning Ministry. The new appointee is Yousef El-Haj Elias, a prominent attorney in Mosul.

•

**ITALY—The "very favorable" Russian crude price ENI's Enrico Mattei won for his 1961-65 Soviet oil import deal (PW—Oct.14'60,p10) offers a "great advantage over the international price,"** he asserted last week.

The four-year agreement averages out to 60,000 b/d, including undisclosed volumes of fuel oil as well as crude. Italian tankers will haul the oil from Black Sea ports—meaning, Mattei said, a saving of about half on Persian Gulf transport costs.

•

**PERU—Cerro de Pasco Corp., U.S.-owned mining company, will start wildcatting in eastern Peru** before the end of the year in a search for oil for its own operations there.

Its first wildcat is projected for 11,000 ft. at a site 140 mi. south of Pucallpa in the Palcazu River basin, about 100 mi. south of the nearest of two existing fields in the remote trans-Andean area. An Ideco H-750 rig is now being flown in for the test.

•

**VENEZUELA—Eleven oil companies in Venezuela participated in backing this year's $100-million loan to the Venezuelan treasury** by five U.S. banks (PW—Oct.7'60,p84).

Over half, $51.6-million, was guaranteed by Creole. The others: Shell, $25.8-million; Mene Grande, $7.9-million; and the rest by International Petroleum, Mobil, Atlantic, Texaco, Sun, Sinclair, Richmond, and Phillips.

•

**SPAIN—Jersey Standard has announced an appeal from the Spanish government's refusal to grant it petrochemical rights in Spain** in cooperation with Cepsa, a Spanish company (PW—Sep.23'60,p103).

The appeal, filed with the Ministry of Industry, argues against the government's contention that the proposed $10-million venture would duplicate a project already approved for Dow Chemical Co. and its Spanish partner. Shell, also turned down recently, has filed a similar appeal.

•

**EL SALVADOR—Esso's projected refinery, like Shell's, will have only 5% local capital participation.** Esso has just been granted this second exception to a foreign investment law requiring 50% Salvadorean participation.

•

**VENEZUELA—Creole Petroleum Corp. has appointed a third Venezuelan to its board. He is Federico G. Baptista,** production department manager since 1958, and a Creole employee since 1936. The appointment drew favorable comment last week from the Oil Minister, who called promotion of Venezuelan personnel to top oil firm posts "in the public interest."

•

**UNITED KINGDOM—The 1960 edition of "Oil & Petroleum Year Book," an international directory, is now available.** Copies may be purchased for $7, post-free, direct from the publisher: Walter E. Skinner, 20 Copthall Ave., London E.C. 2.

•

**VENEZUELA—More concession turnbacks, totaling nearly 150,000 acres, were announced by the Oil Minister** last week. They were made by five companies: Shell, 54,300 acres; Sinclair, 50,600; Atlantic, 22,200; Creole, 13,100; and Pancoastal Petroleum, 9,400.

•

**GABON—Mobil has a 50% interest in two further discoveries recently made here by the French firm Spafe.** Mobil was also a partner in one previous find.

No. 1 Betanga flowed 150 bbl. of 40-gravity oil on 12-hour test of an interval of 6,314-53 ft. No. 1 N'Tombenyoni produced 41-gravity oil at the rate of 75 b/d through ⅛-in. choke and perforations at 4,946-69 ft.

•

**SAUDI ARABIA—Oil output climbed nearly 90,000 b/d in September to a record** of 1,249,092 b/d, topping the previous high set last February. Aramco's crude runs at Aramco's Ras Tanura refinery also broke a February, 1954, record with a 252,088 b/d average for the month.

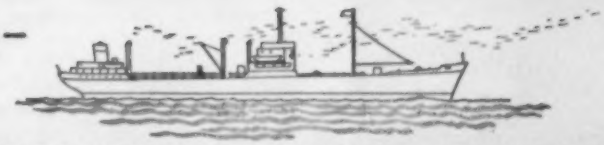
## Few Bids on Cairo's Oil Rights Offer

**CAIRO—Only three firm bids were submitted for new oil rights in Egypt's Western Desert, official sources confirmed last week.**

The bidders: Pan American International, the one newcomer to Egypt; Italy's ENI, which has a stake in Sinai production; and Anglo-Egyptian Oilfields, an integrated Shell-British Petroleum affiliate.

**All three companies have reportedly accepted the principle of government participation,** but no decisions on the bids have yet been made by a General Petroleum Authority study committee. It is said to be open to further offers.

IN SHIPPING—



# CHIKSAN MARINE LOADING ARMS

## GIVE A MODERN DAY LIFT TO TANKER LOADING!

No imitators can match the highly successful performance of the Chiksan Hydraulic Marine Loading System. The Chiksan unit moves into position under power—quietly responding to a single operator's control; durable, smooth bore 8", 10" and 12" *interior diameter* lines permit higher flow rates while pumping. Once hooked up, no attendance is required. At the heart of every Chiksan HMLA system are time-proven Chiksan swivel joints with packing life measured in *years*, not weeks or months. Safer, faster and most economical to operate, the Chiksan Hydraulic Marine Loading Arm belongs in your plans. Ask Chiksan to quote on this most efficient system.

***Where once a crew of seven men labored for 30 minutes to hook up a rubber line, now one man operating hydraulic controls can swing a Chiksan Loading Arm aboard, for hook up, in less than a minute.***

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

fmc CHIKSAN

CHIKSAN COMPANY—General Offices: Brea, California • Well Equipment Mfg. Corp. Division (Weco Unions, Hamer Valves) • Chiksan International • Chiksan of Canada Ltd.

Offices and Representatives in Principal Cities of the World

SITE OF LEAK in pipeline in Mississippi, viewed from incoming helicopter.

# Repair-Time on Pipeline

**THE PROBLEM: How to repair a leak in a pipeline in a remote bayou in the fastest time possible?**

**A pipeline-repair job that would have taken three days if conventional transport had been used to reach the leak-site in a Mississippi bayou was completed in three hours by using a helicopter.**

Use of whirlybirds to haul men, equipment, and materials to areas that are inaccessible to other means of transport, or are accessible only with great difficulty is rapidly gaining acceptance in the pipeline industry. For example, a helicopter was used successfully last spring to string pipe in the building of a line in a Louisiana coastal marsh (PW—Mar.11'60,p40).

**A 3-mi. airlift of welding equipment to repair a loop of United Gas Pipe Line Co.'s line in Ward Bayou was performed recently by Petroleum Helicopters, Inc.,** a pioneer in the field.

The 30-in. loop runs from Lirette to Mobile.

The 600 lb. of equipment could have been brought to the defective portion of the loop in the remote swampland by only two other means —both difficult, time-consuming, and expensive, according to United Gas.

One of the ways would have been to use a marsh buggy to carry the equipment from the nearest road, 3 mi. away.

The other would have been to barge the welder with a tractor, up the Pascagoula River to a point on its course nearest the affected part of the loop, and then to haul the equipment the rest of the way through the swamp with the tractor.

"By either of the first two methods, time required to complete the work was estimated at three full days," says a spokesman for United Gas.

**Actual flight of the whirlybird took only minutes. With the equipment landed, repairs got under way at 10:40 a.m., and by 1:30 p.m. the equipment had been moved out.**

The leak—a pin-hole—had been discovered earlier by a pipeline crew working in the area.

The exact site of the leak was a dried lake-bed.

However, after breaking the crust, the crew hit gumbo, and water filled the "bell hole" (the area excavated around a pipe leak to permit repair).

It was then necessary to carry pumps in by foot to drain the water

# Chemical Firms Wary of LPG Exports

**Two Canadian chemical companies are worried about the possibility of running short of gas liquids for their plants if the request of Foothills Pipe Lines, Ltd., to export these hydrocarbons is authorized.**

Foothills wants to build a 16-in. pipeline from the Alberta-Saskatchewan border to North Dakota to move LP-gas that will be produced along with the Alberta natural gas that is slated for export (PW—Jun.10'60, p44).

A gathering system to connect with the main line would be constructed by Westalta Products Pipe Line, Ltd.

**Canadian Chemical Co., Ltd., and Canadian Industries, Ltd., voiced their concern at recent hearings before the Alberta Oil & Gas Conservation Board, which have been marked by heavy opposition to Foothills' plan.**

Among the other opponents to the proposed 1,244-mi. trunk line and gathering system are Provincial Products Pipelines, Ltd., Hydrocarbons Pipeline, Ltd., and British-American Oil Co., Ltd. All of these also have sought approval for gathering systems of their own.

In addition to objecting to the Foothills-Westalta project on the ground that it would enable the two firms to corner the LPG transport market, these companies, too, charge that export of the quantities proposed might cut into domestic requirements.

**Foothills wants to export 68,238 b/d in 1962, 79,640 b/d in 1963, and 131,045 b/d in 1970.**

All other plans now under consideration by the conservation board call for shipments of smaller amounts.

**Chemical Industries told the board that it was "unable to see from the evidence submitted how this proposal would either benefit or assist the manufacturers of petrochemicals within the province,** who create wealth and provide employment . . ."

A spokesman said that the plant also uses ethane, which the company fears might be unavailable in the re-

# Cut from Days to Hours

**THE SOLUTION: Use a helicopter to airlift the necessary equipment to the job.**

LOADING of whirlybird is done 3 mi. away—nearest point that a truck can reach.

so that closer inspection could be made.

The inspection showed no cracks around the hole, which was in a longitudinal weld.

While pin-holes aren't considered major defects, "there is always the possibility they may become more serious," according to United Gas.

To permit repair, pressure in the loop had to be dropped from a normal 850 psi. to 25 psi. The affected area was then ground down to ⅛ in. of metal and, finally, the seam was rewelded.

**Service was uninterrupted during the repair operation,** United Gas says.

Reasons were the speed made possible by use of the helicopter, and close communication through 'walkie-talkies' with valve stations.

IN DENSE GROWTH near job-site, helicopter comes in for a landing.

PIN-HOLE LEAK in longitudinal seam is rewelded with airlifted equipment.

quired quantities if the exports are approved.

**Canadian Chemical asserted that the "dynamic nature of the [petrochemical] industry indicates that new requirements for LPG may develop in advance of expectations."**

Present consumption of propane and butane at the company's Edmonton plant amounts to 2,075 b/d.

A spokesman indicated, however, that it is impossible to forecast needs accurately beyond five years, and that authorization of the Foothills' plan would commit large, fixed quantities of LPG to export for 25 years.

**Foothills contended at the hearings that it plans to export only "surplus" liquids.**

A spokesman told the board that, first, "needs here will be attended to."

# What's New / IN TRANSPORTATION

**Continental Pipe Line Co. will build a crude pipeline system from Cut Bank, Mont., to Byron, Wyo., to provide an outlet for several important fields in central and northwestern Montana.**

Along the route of the 433-mi. line in the northwest part of the state are the Kevin Sunburst and Pondera fields. From the Stensvad and Sumatra fields in central Montana, a 55-mi. lateral will run to the main line at Roundup.

Initial capacity of the $13.5-million line will be 50,000 b/d.

The crude will be delivered at Byron to Platte Pipe Line Co. and other systems for shipment to the St. Louis and Chicago areas.

Completion of the system, to be known as the Glacier Pipe Line System, is scheduled for next summer.

•

**Work on the Turnagain Arm crossing of the gas pipeline being built from Alaska's Kenai Peninsula to Anchorage has been stopped for the winter.**

An attempt was made in August to

## Now USS National Electric Weld line pipe can be internally coated right at the plant

National Tube has erected new buildings and equipment at the Orange, Texas, and McKeesport, Pennsylvania, plants. Your contractor can use these facilities to apply internal epoxy coating for increased flow efficiency and easier cleaning of line pipe.

The coating facilities are all *under roof* to eliminate

This mark tells you a product is made of modern, dependable Steel

weather hazards. No corrosion, water, or dust to complicate coating operations. You get a uniform, high quality internal coating job. We invite you and your coating contractor to visit our plants and see how these facilities can help you. Or write to National Tube, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

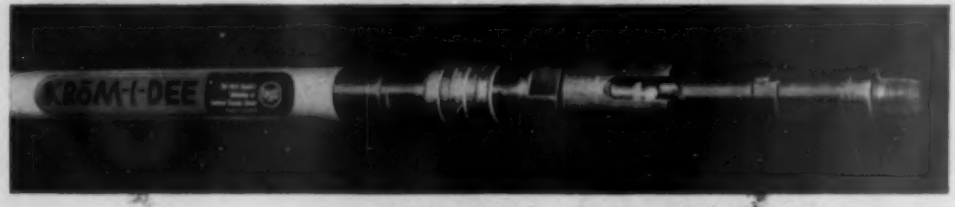
*USS and National are registered trademarks*

**National Tube**
**Division of**
**United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

# Looking for lower lifting costs? Try one of these "Oilwell" Pumps!

**NITRILINE** is a new, popular-priced alloy-steel barrel designed for over 80% of today's wells. "Oilwell's" patented Nitrocycle hardening process gives it a hard and uniform inner surface, with an extra tough outer shell. This barrel resists both severe abrasion and mild corrosion.




**KROM-I-DEE** has an extremely hard inner chrome coating which withstands sweet corrosive fluids in carbon dioxide wells and resists abrasion in very sandy wells. Can also be furnished with chrome inside and out.

**HI-BRIN:** This extremely hard barrel metal is designed for severely corrosive, sour well fluids. Inside wall is nitrided by patented process after finish honing to assure accurate dimensions and even depth of hardness.

**SILVERLINE** is for wells which have no serious corrosion or abrasion problem. Honed seamless steel tubing is internally coated with antigalling protective compound which allows plungers to be closely fitted.

Oil Well Supply Division of United States Steel

USS

These one-piece "Oilwell" pump barrels with quality fittings are available in most A.P.I. sizes and lengths at pump shops associated with Oil Well Supply stores. You'll appreciate the cooperative service offered by the experienced subsurface representatives who man these shops.

*USS, "Oilwell", NITRILINE, KROM-I-DEE, SILVERLINE and HI-BRIN are registered trademarks*

Executive Offices—Dallas, Texas
Export Office—30 Rockefeller Plaza, New York 20 N. Y

start laying the dual 12-in. line across the inlet, which separates the peninsula from Anchorage. But the discovery of two unmarked channels, plus high tides and winds that were expected to grow stronger, brought efforts to a halt.

The 165-mi. line is being built for Alaska Pipeline Co., whose franchise to begin deliveries expires in December, 1961.

Work on the crossing will be resumed in the spring in an effort to finish the line before the deadline.

•

**Shell Oil Co. will excavate a cavern in a salt dome near Sorrento, La., for storage of 425,000 bbl. of butane for its nearby Norco refinery.**

During the winter, period of peak butane consumption, the refinery has had to buy 850,000 bbl. at high prices to supplement its own production, according to Shell.

The company says that the new facility will enable it to purchase butane at lower summer prices for storage for winter use.

•

**Service Pipe Line Co. has started construction of a 22.5-mi. segregated pipeline system to gather heavy crude in the Beaver Lodge Devonian pool, Williams County, N.D.**

The crude, difficult to move by pipeline because of its high viscosity, will be moved to Service's Ramberg station, where it will be mixed with lighter crude for further shipment.

•

**Natural Gas Pipeline Co. of America has acquired the assets of Peoples Gulf Coast Natural Gas Pipeline Co.,** formerly Texas Illinois Natural Gas Pipeline Co.

Both companies are subsidiaries of Peoples Gas Light & Coke Co., and operate pipelines from Texas to Joliet, Ill.

•

**A broad cross-section of groups striving to keep down waterways transport costs—including oil companies—is represented on the new board of the National Waterways Conference, Inc.**

Among directors named at a recent meeting were Paul Blazer, chairman of the executive and finance committees of Ashland Oil & Refining Co., and G. J. Derrick, manager of the transportation division of Phillips Petroleum Co. (PW—Oct.7,60,p92).

LATEX QUALITY PIPELINES
BRING REPEAT BUSINESS

For over a quarter of a century the Quality line has been synonymous with the name *LATEX*. *LATEX* is renowned for their ability to build quality line rapidly and efficiently.

***REMEMBER, LATEX QUALITY BRINGS REPEAT BUSINESS "AGAIN AND AGAIN"***

LATEX

*Another quality service of LATEX is CONSTRUCTION OF PEAK SHAVING PLANTS. Pictured here is Atlanta Gas Light Company's Riverdale peak shaving plant near Atlanta.*

**LATEX CONSTRUCTION CO.**

**P. O. BOX 12128 • ATLANTA 5, GEORGIA • CE 3-9414**

MISSILES TO MUFFLERS

*Bridge production gap for oil field manufacturer*

# *Beaird-AMF A company on the go!*

## NEW PRODUCTS, SKILLS, IDEAS SPARK DRIVE

Under the guidance of a tall (6'3") soft-spoken Texan, President John L. Tullis, Beaird is on the rebound from a low caused when the oil industry skidded into its own personal recession in 1958.

Long a major supplier of equipment (skid-mounted packaged compressors, pressure storage vessels, rail tank car tanks, steel piling, LP-Gas transports and home LP-Gas systems), Beaird has repeatedly demonstrated its ability to move swiftly in a competitive situation. Pioneering with the first packaged compressor plant in 1946, they established and dominated the market for this product despite intensive competition. Equally in the LP-Gas industry, Beaird moved, in five years, from its first LP-Gas system in 1946 to the industry leadership, with a host of products serving every phase of the market from dealer to home.

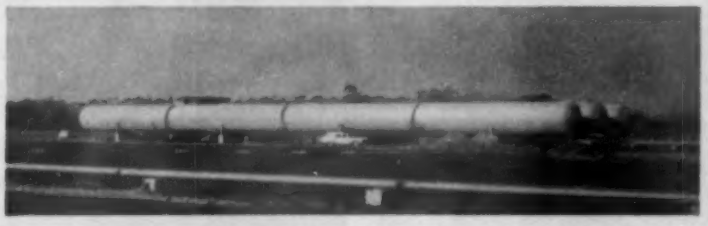
Now entering new markets with new creatively engineered products ("Belex," a self-operated condensate recovery unit for installation at wellheads and a skid-mounted complete gasoline plant composed of eight separate processing units), Beaird has received an additional boost from acquisitions and defense contracts. Maxim, the oldest name in silencers (gross sales $3,000,000 in 1959) has been acquired by AMF and assigned to Beaird to manufacture and market. The bustling shop program is also producing an $8,500,000 order for giant Atlas Missile launching components and a large order for stainless steel Titan missile fuel tanks. Beaird has targeted a stepped-up sales goal in '60 and is headed upward with a rush that may well take it far beyond its most optimistic predictions. From its people in the shops to its wide-flung dealer and sales organization, there is a firm belief that Beaird-AMF is a company on the go . . . *and getting there in a hurry!*

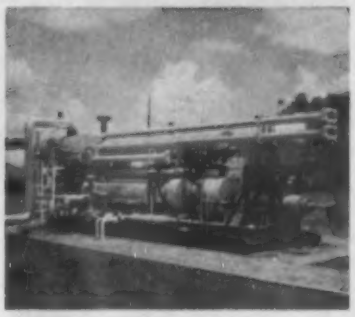
## BEAIRD-AMF

*World's Largest Fabricator of LP-Gas Systems*

*Long lasting enamel finish* is just one of many basic improvements Beaird has brought to LP-Gas industry. To make new finish possible Beaird installed giant "assembly line" plate shot blast equipment at both Shreveport and Clinton plants. Beaird has continued to strengthen its LP-Gas market position with a vigorous dealer program that includes area stocking and long term financing.

*$CO_2$ Transport,* has welded aluminum shell over four inches of insulation that surrounds the T-1 steel . . . 325 psi tank. Other specialized Beaird units are formed of stainless steel for chemical hauling. T-1 Steel Transports for LP-Gas Market lead Beaird transport sales.





*World's largest LP-Gas storage vessels* —capacity 5,000 bbls. each were built by Beaird for Creole Petroleum, Venezuela. One of firm's oldest and best known products, Beaird storage vessels are manufactured in a size range from 6,000 wg. to 105,000 wg. capacity for the oil, gas and petrochemical industries.

*Belex Condensate Recovery unit,* mounts at wellhead to extract hydrocarbons (gasoline, propanes, methanes, etc.). Fully packaged and automatic in operation, the Belex unit offers high product recovery with low installation cost.

*10,000,000 Cubic Feet of Gas per Day* can be handled by this Beaird Skid Mounted Gasoline Plant. Expensive field labor and installation hook-up is reduced to minimum and the plant is almost wholly salvable when moved to a new location. It was process engineered and installed by O. L. Olson Engineering, Houston, Texas.

*Twenty-five ton silencer,* one of the many Maxim silencers now produced by Beaird. Others include little two-pound units for home lawn mowers, sizes for heavy duty engines and special types for ships and industrial plants.

another AMF BEAIRD product

**THE J. B. BEAIRD COMPANY, INC.**

*A subsidiary of American Machine & Foundry Company*

SHREVEPORT, LOUISIANA

SALES OFFICES

Shreveport, New Orleans, La. • New York, N. Y. • Tulsa, Okla.
Houston and Midland, Texas • Hartford, Conn.

BEAIRD INTERNATIONAL, INC.
SHREVEPORT, LOUISIANA

*Navy Submarine* has an AMF-Maxim monel and stainless steel sea water plant which demonstrates Beaird's new metal handling skills. Fabrication including welding of aluminum and magnesium for rail tank cars as well as work in other exotic metals has become a routine assignment at Beaird.

## Memo to Management:

# ONE BILL...ONE RESPONSIBILITY MEANS A BIG SAVINGS TO US...

Whether it's power for a pipeline, refinery or pumping, many oil companies prefer to purchase dependable utility electric power and get all power bills on one convenient monthly invoice. Utility electric power works 24 hours a day or operates on any fractional time schedule . . . in any case you pay only for the power used and eliminate many worries. For details contact your nearest Utility Electric Power Company.

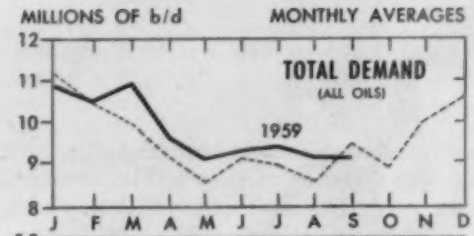
PETROLEUM ELECTRIC
POWER ASSOCIATION

BOX 35006, DALLAS 35, TEXAS

*A list of P.E.P.A. members will be furnished on request.*

PETROLEUM WEEK'S

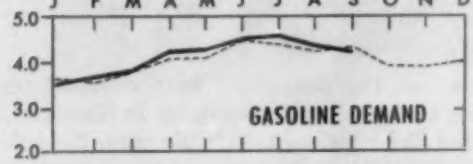
# Fingertip Figures




*Figures for period ended Oct. 14, except as noted*

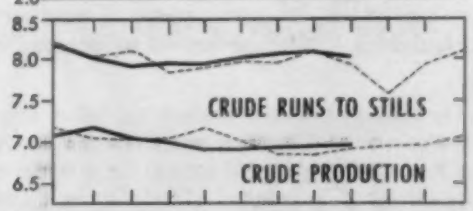
**TOTAL DEMAND**

| | |
|---|---|
| Latest 4-week average | 9.098 |
| Year ago | 9.028 |




**GASOLINE DEMAND**

| | |
|---|---|
| Latest 4-week average | 4.218 |
| Year ago | 4.222 |

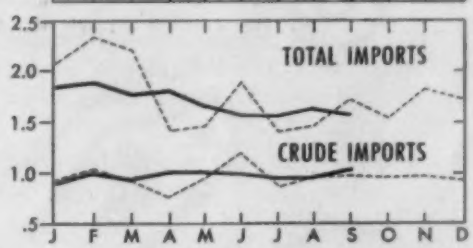



**RUNS TO STILLS**

| | |
|---|---|
| Latest week | 7.898 |
| Previous week | 7.880 |
| Year ago | 7.759 |

**CRUDE PRODUCTION**

| | |
|---|---|
| Latest week | 6.824 |
| Previous week | 6.803 |
| Year ago | 6.839 |

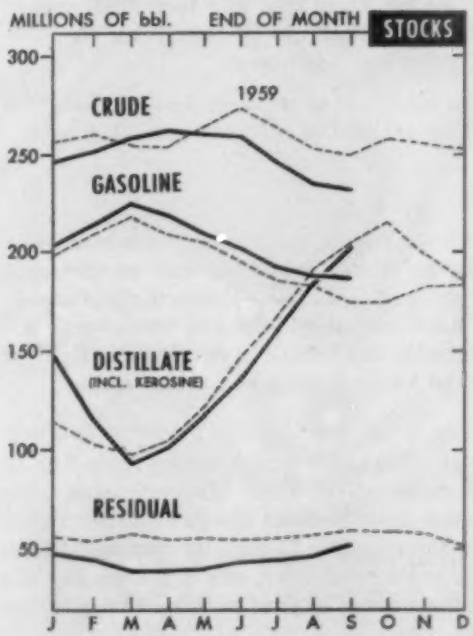



**TOTAL IMPORTS**

| | |
|---|---|
| Latest week | 1.609 |
| Previous week | 1.571 |
| Year ago | 1.460 |

**CRUDE IMPORTS**

| | |
|---|---|
| Latest week | .956 |
| Previous week | .921 |
| Year ago | .949 |




**CRUDE STOCKS**

| | |
|---|---|
| Week ended Oct. 8 | 230.0 |
| Previous week | 231.9 |
| Year ago | 250.9 |

**GASOLINE**

| | |
|---|---|
| Latest week | 188.2 |
| Previous week | 188.6 |
| Year ago | 178.7 |

**DISTILLATES**

| | |
|---|---|
| Latest week | 211.1 |
| Previous week | 206.6 |
| Year ago | 213.4 |

**RESIDUAL**

| | |
|---|---|
| Latest week | 51.4 |
| Previous week | 50.8 |
| Year ago | 59.6 |

**Ludicrous as it may seem in the light of the current stock situation, crude runs nosed up again last week by 18,000 b/d.** Crude throughput averaged 7,898,000 b/d, compared with the previous week's level of 7,880,000 b/d. The increase isn't much in itself—it's the trend that's alarming.

Consequently, inventories of the major products are continuing to pile up. Stocks of the burning oils scored a rise of more than 5-million bbl., with middle distillates accounting for 4.5-million bbl. of the increase.

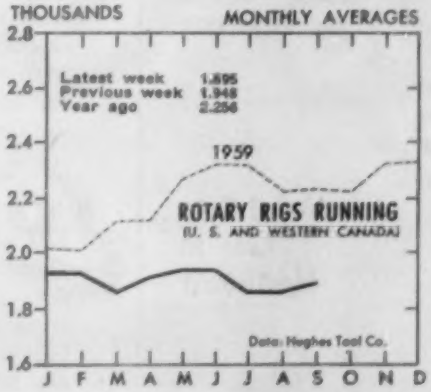
Motor fuel inventories took a downturn, but it was still just a dip—483,000 bbl. Gasoline stocks are now 9.5-million bbl. higher than a year ago, and almost 24-million bbl. higher than industry's so-called desired levels.

**October demand can't be expected to bail refiners out—most economists agree that it won't be any great shakes.** Gasoline demand may look surprisingly good compared with last year's levels. But this is due to the weakness that set in last October, following the artificial spurt in demand in September that preceded the hike in the gasoline tax last Oct. 1.

The distillates market is listless so far, too.

**Stocks of crude are feeling the drain of high runs again.** After a moderate climb that began in mid-September, crude inventories sagged to 230-million bbl., a decrease of 1,885,000 bbl. from the previous week. They are more than 22-million bbl. shy of "desired."

**For November, the Bureau of Mines has forecast runs of 7,910,000 b/d.** Its estimate of runs for September is 8,082,000 b/d; for August, 8,236,000 b/d.



# The Market Trend

## There's More Than Beluga in the Black Sea

**Mr. K's UN antics to the contrary, Russia may be willing to look kindly on a producing-nation, price-holding, proration system for oil with the West. That's the hope in Europe.**

**Russia hasn't been the only tiger in the streets,** say the Europeans. Russia has sold cheap, true. But so has Shell. So has BP. So has Jersey, AGIP, Mobil, and just about everybody else.

**After all, it's been a tough siege since Suez.** As one sales executive put it to Petroleum Week, "Markets in Greece and Italy are bad enough. Germany is pretty awful. And we won't talk about Scandinavia, thank you." But all these markets are growing: Italy is showing a 27% gain so far this year over 1959. So nobody's going to quit now.

**Maybe it's from desperation, but the Europeans have dreamed up the idea that Russia may be willing to "play ball."** They did it on diamonds, didn't they? Years ago, they acted like "businessmen." It's only, the old-timers say, that the Soviets have got into a suspicious phase. Forgotten for the moment are all the petty quirks a Westerner has to adjust to in dealing with Russia.

**Item: Weather reports in the Black Sea for tanker captains are** nearly top secret. Demurrage is frequent at Odessa and Tuapse. And there's the dickens to pay if the Russians overload a cargo—somebody's head will fall if you don't pay the difference en route.

**But, say the Europeans, the Russians used to be commercial people, and maybe it will happen again.** Russia doesn't cut the price of caviar, they point out. You can't buy vodka cheaper than gin. Russian furs aren't sold in U.S. discount houses.

**Of course this is all a pipe dream in the West, and Russia may make great political hay out of it.** Russia's position likely will be to turn its collar around and glibly swear it will "abide."

**For if somebody says amen on prices and volume in Beirut, sooner or later somebody will cheat.** And when it comes to hidden discounts, secret arrangements, and the like, the Europeans are experts.

**Summing up: Look for three more years of tough competition.** The Europeans know stability when they see it. It's not here now, they say.

### LP-Gas Supply Tightens

There is talk of tightness this winter in LP-gas, but trade comment also runs that it would take a severe winter to create any serious spot shortages. The days' supply of propane shrank to 43 days in mid-October from 48 days a month earlier. Last year at mid-October there was a 49-day supply on hand. Mixes are tight, and butane is particularly tight at the Gulf, where chemical demand keeps it snug and prices stable.

### Mobil Cuts 'Gas' in Northeast

Mobil Oil Co. reduced wholesale gasoline price reductions by from 0.5¢ to 1.7¢ a gal. last week in four states—New York, Massachusetts, New Hampshire, and Maine. What was notable about the price cuts was the date—Oct. 13, six weeks after the so-called Labor Day "hump." These areas are historically noted for price sensitivity, and suppliers say the lateness of the cuts attests to the unusually good position that gasoline has held this past summer.

## why CIG supervises remotely, automates locally

Colorado Interstate Gas Company dispatchers transmit only desired discharge pressure settings; automation at each compressor station responds by maintaining the selected value for optimum system economy. ■ If communication links fail, local automation operates without interruption. Log-Alarm units insure station safety. Dispatchers are alerted only when trouble occurs. ■ Solid-state components assure maximum reliability. "Building-block" design allows SIE to fit your needs exactly. ■ Accelerate your operating cost reduction program by writing: **SOUTHWESTERN INDUSTRIAL ELECTRONICS**

10201 Westheimer / P. O. Box 22187 / HO 5-3471 / Houston 27, Texas

*Division of Dresser Industries, Inc.*

SIE DI

# The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of October 17

Bold face type indicates changes from previous week

## KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

### Western Hemisphere

**U.S. Gulf Coast, cargoes**
- Gasoline, 98 oct prem....12.25-13.25
- Gasoline, 92 oct reg....11.25-11.5
- Kerosine....9-10
- Heating oil, No. 2....8.25-9
- Gas oil, 48-52, d.i....8.5-8.875
- Fuel oil, bunker "C"....$2.30

**Caribbean, cargoes**
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....11
- Gasoline, 87 oct research reg....10.125
- Gasoline, 80 oct research....9.375
- Gasoline, 70-72 oct motor method....9.25
- Kerosine....9.25
- Heating oil, No. 2....8.125
- Gas oil, 48-52 d.i....8.375
- Fuel oil, bunker "C"....$2.00

**New York Harbor, barges**
- **Kerosine....10.1↓-10.35↓**
- **Heating oil, No. 2....9.1↓-9.35↓**
- Fuel oil, No. 6....$2.62

**Okla.-Group 3, northern shpt., bulk**
- Gasoline, 91 oct reg....12.5-13.25
- Kerosine....10.5-10.625
- Heating oil, No. 2....9-9.25
- Fuel oil, No. 6....$1.80-1.90

**Chicago, bulk**
- Gasoline, 92 oct reg....12.625
- Heating oil, No. 2....9.5-11.35
- Fuel oil, No. 6 high sulfur....7.65

**Los Angeles, rack**
- Gasoline, 88 oct reg....11.3-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.90
- Heavy fuel, PS 400....$2.05-2.45

**Natural Gasoline, Grade 26-70**
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

**LP-Gas**
- Propane, Oklahoma (Group 3)....4.5-5
- Propane, Baton Rouge....5.625

**Pennsylvania Lubes**
- Bright stock, 25 p.t....25
- 200 vis. neutral, 25 p.t....28

**Mid-Continent Lubes, Tulsa basis**
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200-210 vis....23-24

**Gulf Coast Lubes**
- Bright stock, solvent, 95 v.i....26
- Neutral, solvent, 200 vis....23

### Eastern Hemisphere

**Singapore (Pulau Bukom) cargoes**
- Avgas, grade 100/130....15.5
- Gasoline, 79 oct research....9.125
- Kerosine....9.625
- Gas oil, 48 d.i. minimum....8.75

## KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

### Western Hemisphere

**United States (at the well)**
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.69-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....2.96-3.31
- Illinois Basin, flat....3.00-3.05
- Pennsylvania Grade, Bradford dist., flat....4.80
- California, Signal Hill, 21.0-21.9....2.33†
- North Louisiana-Arkansas, 36.0-36.9....2.72-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

**Canada (flat prices, at the well)**
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.44
- Virden (Man.)....2.30

**Venezuela (Cargoes, FOB lifting port designated)**
- San Joaquin, 41.0-41.9, Puerto la Cruz....$3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, La Salina....1.85
- Lagomar, 31-31.9, Cardon....2.55
- Lagunillas Heavy, flat, La Salina....2.07

*†Differential per deg. of grav. varies*

### Eastern Hemisphere

**Middle East, Persian Gulf (Cargoes, FOB lifting port)**
- Arabia, 34.0-34.9, Ras Tanura....$1.80
- Safaniya, 27.0-27.9, Ras Tanura....1.47
- Iran, 34.0-34.9, Bandar Mashur....1.78
- Iran, 34.0-34.9, Abadan....1.73
- Iraq, 35.0-35.9, Fao....1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.59
- Qatar, 41.0-41.9, Umm Said....1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud....1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud....1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud....1.28

**Middle East, Eastern Mediterranean**
- Arabia, 34.0-34.9, Sidon....$2.17
- Iraq, 36.0-36.9, Tripoli, Banias....2.21

**North Africa, Phillipeville, Algeria**
- Hassi Messaoud, 48 and above....Withdrawn

## KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean....(USMC—5%) $2.71
**U.S. Gulf-New York, dirty. (USMC—7½%) $2.64↓**
NWI-USNH, dirty....(USMC—50%) $1.38
NWI-UK/Cont., dirty....(Scale—67%) 10/10*
Persian Gulf-UK/Cont., dirty....(Scale—42½%) 34/9*
**Persian Gulf-USNH, dirty. (USMC—65%) $4.45↓**

**Sterling*

# A Nalco PRODUCT MANAGER

## Answers Questions About Refinery Equipment Fouling And Successful Anti-Fouling Programs

### Both Organic and Inorganic Deposits in Refinery Equipment Raise Operating Costs, Decrease Throughput

Corrosion control, desalting, oxygen scavenging, gas blanketing and adjustment of process variables will help to reduce exchanger fouling—but in many systems, fouling continues to cause trouble. Here are some of the questions that are asked, and the answers we had to find to them in order to develop anti-fouling programs of real value to refineries.

**Question:** What causes fouling in refinery systems?

**Answer:** Inorganic salts, corrosion products and organic polymers. Inorganic salts are carried into exchanger trains by water dispersed in the hydrocarbon, and deposit out as the water is vaporized on heating. Corrosion products may be carried into exchangers from other units, or corrosion may occur in the exchangers themselves. Organic polymers are insoluble, polar, high-molecular-weight materials, formed as the hydrocarbon is heated.

**Question:** Where does fouling occur?

**Answer:** Fouling may occur in virtually any part of a refinery system; however, these are the areas where fouling is usually most troublesome: heat exchangers and furnaces ahead of catalytic and thermal cracking units, reforming units, and crude units, fractionating towers, reboilers and overhead condensers. Types and amounts of deposits vary, depending on the charge stock, corrosion control measures, and process variables.

**Question:** Why is an anti-fouling program necessary?

**Answer:** Because of the high cost of processing in fouled equipment, created by: reduced heat transfer; lowered throughput; downtime; and direct cleaning costs.

**Question:** How does Nalco solve fouling problems?

**Answer:** By making a careful analysis of the system, locating units where fouling occurs, and finding the sources of fouling. When these facts are available, recommendations are made for an anti-fouling program.

When the program is in operation, Nalco field representatives maintain close contact with operating personnel, cooperating to secure continuously successful, economical results.

**Question:** What is Nalco's anti-fouling program?

**Answer:** It is a program designed for a specific refinery system to eliminate corrosion, organic polymer formation, and any other sources of fouling. Where fouling is due to potential deposit-forming materials in charge stocks, Nalco-developed chemicals are recommended to stabilize and disperse these materials.

Usually anti-fouling additives are used in combination with Nalco corrosion control chemicals; and, where indicated, following Nalco desalting chemicals.

**R. C. Canapary, Product Manager, Petroleum Industry Chemicals Department, Nalco, is a Doctor of Chemical Engineering, whose experience includes technical and engineering work at Nalco, as well as several years with a major oil company.**

The assistance of Nalco representatives in regularly recording and evaluating the effects of temperatures, heat transfer rates, pressures, and other process variables helps to assure optimum results in operating efficiency and treatment economy.

Research and development work is a continuing part of the Nalco anti-fouling program. Nalco researchers use specially-designed equipment to simulate plant operations. Conditions can be established to accelerate fouling rates and speed development of promising new chemicals.

**Question:** How long does it take to establish the Nalco anti-fouling program?

**Answer:** A Nalco anti-fouling program can begin promptly at your request. Nalco considers a program established when anti-fouling and corrosion control results are proven satisfactory.

The electrical resistance method of corrosion evaluation, corrosion coupons, iron-in-water tests, operating records (temperature, pressure, heat transfer coefficients) and direct inspections should be used to evaluate the program's effectiveness.

**Suggestion:** Get full details on a Nalco anti-fouling program for your operation. For quick action, call your Nalco Representative, or write to me at Nalco: Dr. R. C. Canapary, Product Manager, Petroleum Industry Chemicals Department.

**NALCO CHEMICAL COMPANY**
6300 West 66th Place • Chicago 38, Illinois
*Subsidiaries in England, Italy, Mexico, Spain, Venezuela and West Germany*
*In Canada—Alchem Limited, Burlington, Ontario*

Nalco® ... Serving Industry through Practical Applied Science

Nalco CHEMICALS
Nalco SERVICES

## Miles of Mid-America . . .

# SUPPLIED BY SOUTHWESTERN

Southwestern produced a good portion of the Lightwall pipe used in gathering lines on the 2300-mile Mid-America Pipeline delivering LPG from West Texas-New Mexico to the upper Midwest.

Sturdy Southwestern Lightwall Line Pipe is recommended for many different pipeline applications . . . helping to solve problems in transporting hydrocarbons and light petroleum fractions over and through all types of terrain, doing the work of heavier wall pipe at substantial savings in costs.

TAKE A LOOK AT LIGHTWALL by SOUTHWESTERN . . . your PROFIT PIPE

Available in a wide range of sizes for oilfield application.

Write for new folder covering complete details

### SAVE WITH SOUTHWESTERN INTEGRAL JOINT TUBING

Southwestern Tubing can save up to 30% on dual completion well costs over the cost of non-upset. It is expressly designed for more economical Slim Hole and Multiple completions.

Check these outstanding features:

1. Recessed box for easier stabbing and greater resistance to hoop stress induced by make-up.
2. Laboratory pull tests prove joint efficiency to be much greater than theoretical (calc.).
3. Make and break tests far in excess of normal well servicing indicate excellent gall resistance.
4. Multiple hydrostatic, shock and crush tests assure completely sound welds and true dimensional wall thickness.
5. Interchangeable with standard 10Rd. API non-upset tubing.
6. Manufactured to conform to applicable parts of API 5A standards.

LICENSED BY THE AMERICAN PETROLEUM INSTITUTE

**SOUTHWESTERN PIPE, INC.**

P. O. Box 2002 Houston 1, Texas Phone CApitol 4-0631

Sales offices in Midland, Dallas and Tulsa

# How Valuable Is the Company Station?

**Standard Oil Co. of California, Western Operations, Inc., is moving toward greater use of dealers—and is proportionately reducing the number of its company-operated stations.**

California Standard still relies more heavily on company-operated stations than most major marketers. But today, these stations represent only 10% of the company's outlets. Three years ago, one out of every eight stations was company operated. And ten years ago, the ratio was one in seven.

**This indicates a trend toward dealer operation which, the company says, "is made possible by the high caliber of dealers now available."**

G. C. Briggs, general sales manager for retail at California Standard, told PETROLEUM WEEK that "dealers are better today because most of them come from company-operated stations."

At these stations, he says, dealers "get excellent training and know what standard of service customers expect."

California Standard's dealer turnover averages 15½%, which is lower than the industry average.

**Today, California Standard chooses a majority of its new dealers from the ranks of employees at company-operated stations.**

Most of these new dealers have been station managers, and most have been in the service station business three to ten years. Almost half of California Standard's whole dealer corps has seen service in company-operated stations.

"For the outstanding employee at a company station," says Briggs, "becoming a dealer is a kind of a reward."

**The company station also serves as a training ground for executives. California Standard estimates that 45% of its marketing executives have worked in service stations at one time.**

Retail representatives—the marketing men who contact dealers—are basically selected from the ranks of company-station employees. "These are men who average 15 years on service stations," says Briggs. "They know the station business, they have trained cadets, they have relieved other retail representatives on vacation, and thus they are well-equipped to work with dealers."

**Company stations lend themselves more readily to high-volume, highway locations.**

From the merchandising viewpoint, "a company-operated station appeals to the transient public, because it offers uniform dependability," says Briggs. Furthermore, the company station can be kept open for 24 hours, which in many cases is not possible at dealer locations.

Even the high turnover of employees at company stations makes them better suited for highway locations, "where the motorist does not expect to establish a steady relation with a given attendant or manager," Briggs says.

Dealers, on the other hand, are better at developing neighborhood business, because of the personal service they can offer.

"The corner grocery store has disappeared," says Briggs, "but the service station dealer is today's corner grocer, the keeper of the pot-bellied stove."

**California Standard rejects the idea that company stations always cost more to operate than dealer stations.**

"Some dealer operations may be more expensive to operate than some company stations," says Briggs, "depending on volume of gasoline sold, type of business, rent, and numerous other factors."

There are some costs that are common to company stations, however, which are avoided through dealer operation. These include bookkeeping and overhead costs that are assumed by the dealer.

On the other hand, Briggs points out, company stations do not incur the cost of mechanical repair services because they don't offer such services or the costs of handling the extra-profit items that many dealers carry.

# Another Setback for Fair Trade

**The state supreme court of Pennsylvania has decided that major oil companies must first prove that their fair-trade programs are exempt from antitrust laws before they can be enforced.**

In a ruling against Gulf Oil Corp., the court, by a vote of 6 to 1, reversed an opinion of a lower court. The lower court had issued an injunction against a Gulf dealer who had insisted on pricing below his supplier's fair-trade prices. (The dealer had not signed a fair-trade contract).

The supreme court's ruling returns the case to the lower court for a decision in keeping with its verdict.

**This is the second setback for fair trade in Pennsylvania in five months.**

In May, a lower court reversed a decision that had prohibited a dealer for Sinclair Refining Co. from pricing below his supplier's fair-trade minimums in Pennsylvania (PW—Jun.10 '60,p35).

**In last week's decision, the supreme court reasoned that the fair-trading of gasoline does not lend itself to exemption from antitrust law.**

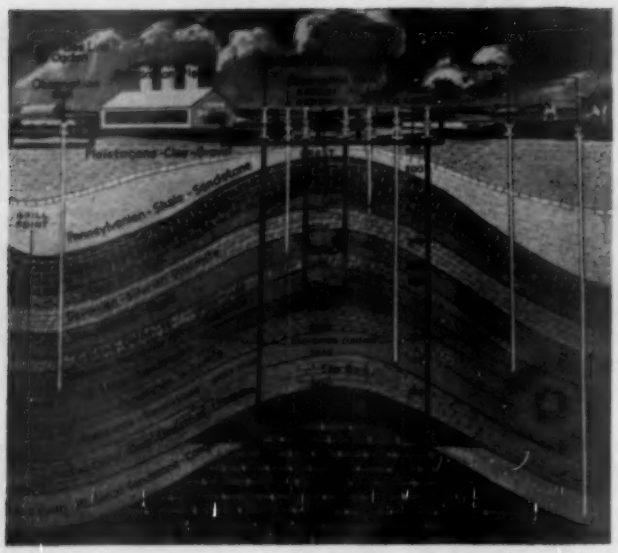
Here's the court's justification of this position, as presented by Judge Herbert B. Cohen:

- The Miller-Tydings Act grants exemption of fair-trade programs from the Sherman Antitrust Act, provided the products involved are in "free and open competition with commodities of the same general class produced or distributed by others."
- "If there is so-called conscious parallelism in fixing gasoline prices, it is certainly probative evidence that in fact gasoline is not sold in free and open competition."
- Therefore, it is incumbent upon Gulf and other major oil companies to prove to the satisfaction of the court that they are not price-fixing.

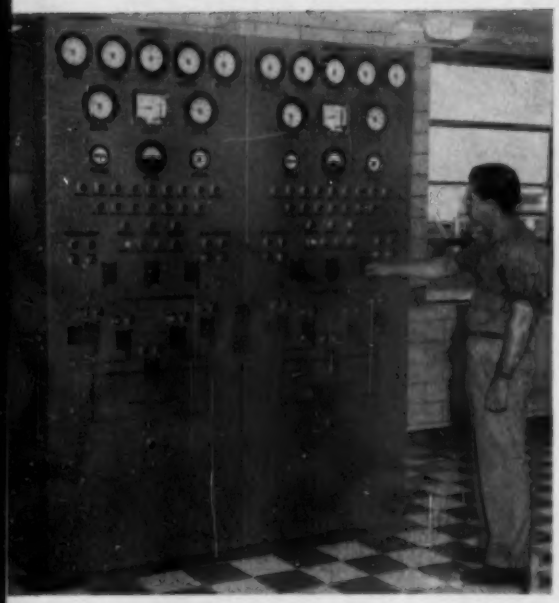
"By its very nature," Judge Cohen concluded, "the gasoline industry does not clearly appear to be appropriately suitable for fair-trade usage."

In the future, the lower court "must thoroughly examine this problem of whether a gasoline company may validly resort to fair trade privileges," he warned.

**Judge Benjamin R. Jones dissented from the decision.** He declared that the ruling "is without precedent, and completely ignores principles of law adhered to for many years by this court."

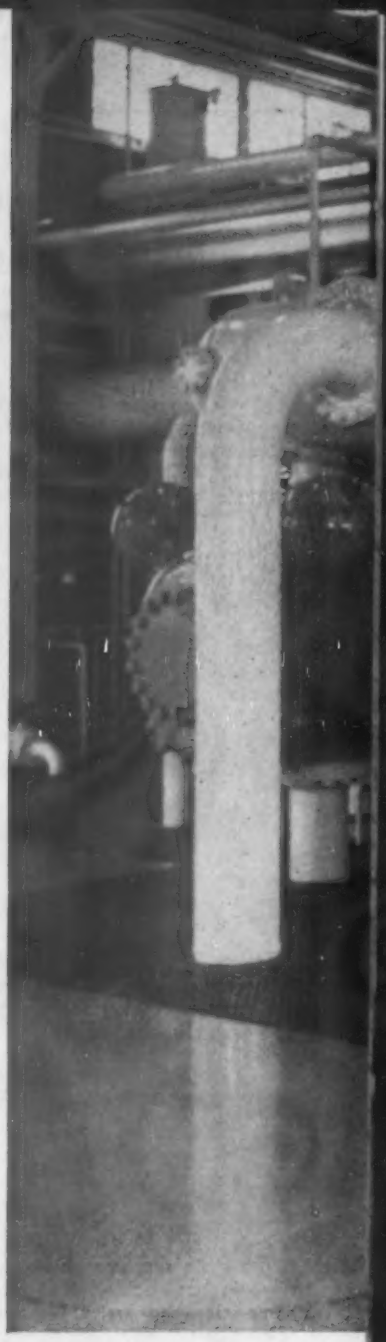


▲ Cutaway drawing of underground storage reservoir at Redfield. This station injects into St. Peter and Mt. Simon sandstone at 59 wells. Ultimate capacity of both strata is about 140 billion cu. ft.

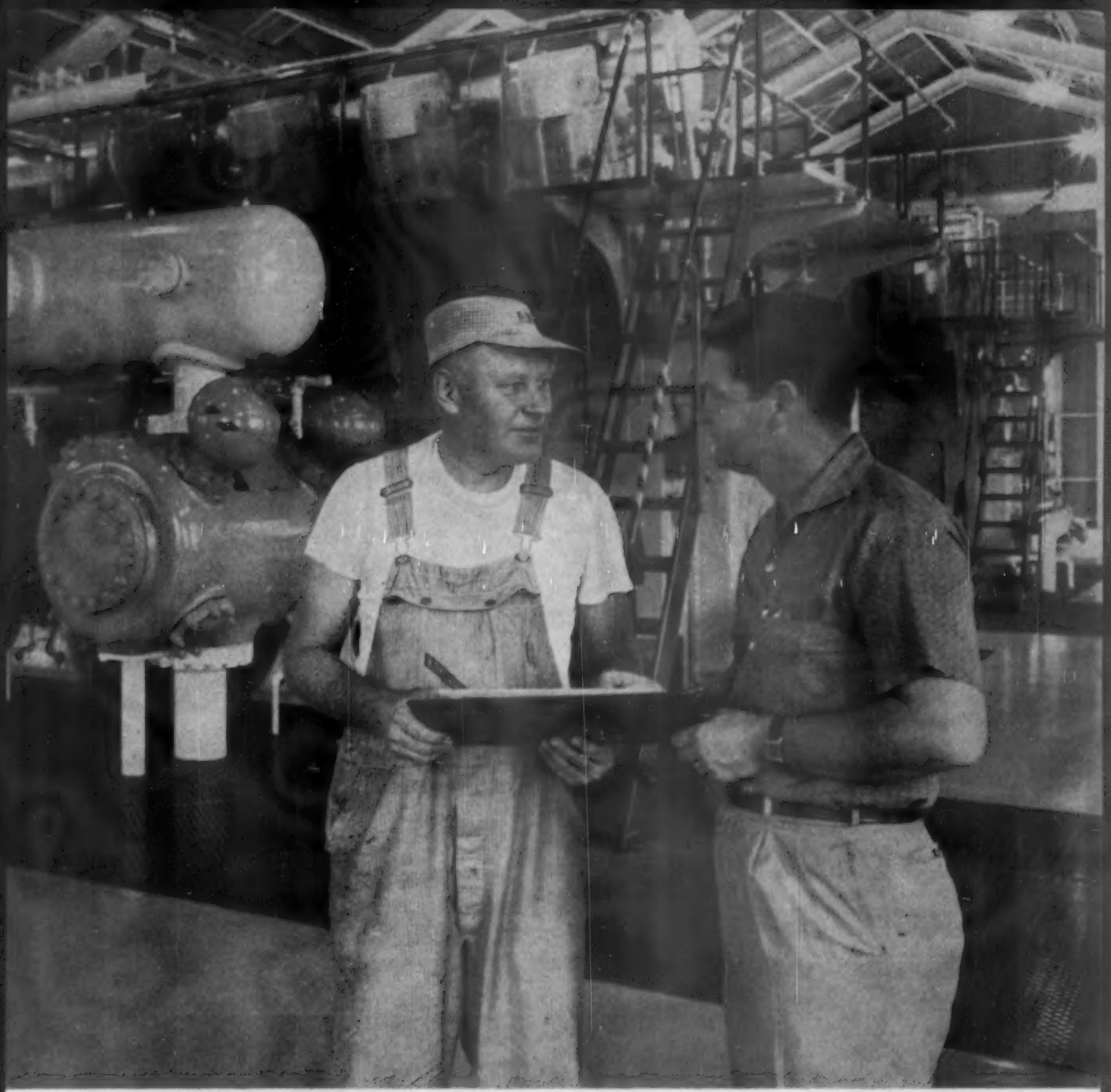


◀ Cooper-Bessemer En-Tronic control provides complete start-stop, loading–unloading automation for the engine driven compressor.

M. H. Raven (right), Superintendent of ▶ Northern Natural Gas Company's underground storage compressor station near Redfield, Iowa, until his recent promotion, discusses the facts with H. E. Hansen, Shift Engineer. Compressor in foreground is GMWA-8, rated 2000 hp. Another similar unit is in the background.



# How a rugged compressor aids a variable-load gas storage program



During its first year's operation, Redfield Station of Northern Natural Gas Company has been put through a rigorous test. According to M. H. Raven, Superintendent, "Our Cooper-Bessemer GMWA-8 Compressor and En-Tronic Control have responded round-the-clock to this program of normal loading, underloading and overloading with remarkable performance. Despite abnormal loading, oil consumption and water usage have been very low. Inspection and cleaning after 12,000 hours showed all parts in perfect condition. It is a *rugged* machine!"

Call our nearest office for help in applying this kind of dependability and load flexibility to *your* compressor operations.

BRANCH OFFICES: Grove City • New York • Washington Gloucester • Pittsburgh • Detroit • Chicago • Minneapolis • St. Louis Kansas City • Tulsa • New Orleans • Shreveport • Houston Greggton • Dallas • Odessa • Pampa • Casper • Seattle San Francisco • Los Angeles • SUBSIDIARIES: Cooper-Bessemer of Canada, Ltd. . . . Edmonton • Calgary • Toronto • Halifax Stratford • C-B Southern, Inc. . . . Houston • Cooper-Bessemer International Corporation . . . New York • Caracas • Anaco • Cooper-Bessemer, S.A. . . . Chur, Switzerland • The Hague, Netherlands Mexico City • The Rotor Tool Company, Cleveland

Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS • DIESEL • GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL
ENGINE, TURBINE OR MOTOR DRIVEN

# What's New / IN MARKETING

**Many service station dealers in North Carolina are following the lead of Virginia dealers and are posting prices ex tax.**

Curb signs are beginning to appear showing the ex-tax price per gallon, with the words "plus 11¢ tax" written below.

S. G. Willcox, Jr., chairman of the North Carolina committee, said the purpose of the new pricing was to "clarify" for the public the price of gasoline and the amount of the tax.

Similar price-posting tactics are reportedly being tried in South Carolina and Tennessee.

•

**Arkansas Louisiana Chemical Corp. opened its fourth service center this month.**

Like the others (PW—Feb.12'60, p46), the new center, located at Pittsburg, Tex., combines sales of gasoline and oil with the merchandising of a variety of nonautomotive products.

The centers are actually outlets for the various gas appliances and other products of Arkansas Louisiana Gas Co., parent of the chemical company.

•

**In a new discount plan, nearly 100 Florida dealers are offering motorists 1¢ to 2¢ a gal. off on gasoline purchases, and discounts of 5% to 7% on service and TBA.**

The plan is coordinated by Universal Travelers Assn., which has opened two "information centers" in northern Florida. Through these centers, Universal directs its member to participating dealers and merchants.

•

**Today's station attendants are suffering from an inferiority complex, according to results of a Dow Chemical Co. study.**

Dow says the attendants feel they are being looked down upon by motorists. Negro attendants, however, have more pride in their job-status.

Biggest cause for attendant discontent, however, says Dow, is not poor job-status but low pay.

•

## Engineering

**Wayne Pump Co. has added a ticket printer to its service station computer pumps, enabling dealers to offer truck drivers and other operators quick receipts with their gasoline purchases.**

The ticket printer is mounted directly on top of the gasoline pump housing.

Previously, says the company, ticket printers were available only on industrial pumps, usually set apart from the islands serving the general public. These pumps generally did not compute cost of sale.

The new Wayne imprinter registers only volume, but being combined with a cost-computing pump it facilitates receipt preparation for dealers.

## Compact Cars: Blessing in Disguise?

**Compact cars will prove more a blessing than a curse to the oil industry within five years, predicts N. J. Haase, director of marketing planning and research at Atlantic Refining Co.**

The compacts, Haase finds, have started the horsepower race all over again. Speaking before API's Market Research Committee last week, Haase noted that the 1961 compacts are sporting average power increase of 10%. He predicted that, in five years, the compacts will rank with today's standard Chevrolet, Ford, and Plymouth in horsepower. One reason for this increasing horsepower, Haase noted, was the trend toward power-hungry torque converters in compacts.

Gasoline consumption of the compacts will equal that of today's standard models in a few years, Haase feels. And since the compacts have smaller tank capacities, he foresees greater opportunities for service station selling (the compacts will need to make more frequent stops than the standard cars).

## Pauley Petroleum Blends the Bizarre with Private-Brand Tactics

**At the rate of one grand opening every ten days, Pauley Petroleum, Inc., is driving back into oil marketing. The integrated independent, which has just opened a station in Bakersfield, Calif., (pictures) is concentrating on typical private-brand techniques, with a touch of the bizarre. Promoting the "world's most mediocre motor oil" and nine grades of gasoline (some only ½¢ apart), Pauley stations also offer peat moss, manure, garden carts, firewood, swimming-pool chlorine—and hostesses.**

AND NOW... A NEW KIND OF QUALITY GASOLINE...

*...the balanced blend made possible by*

# PENEX®

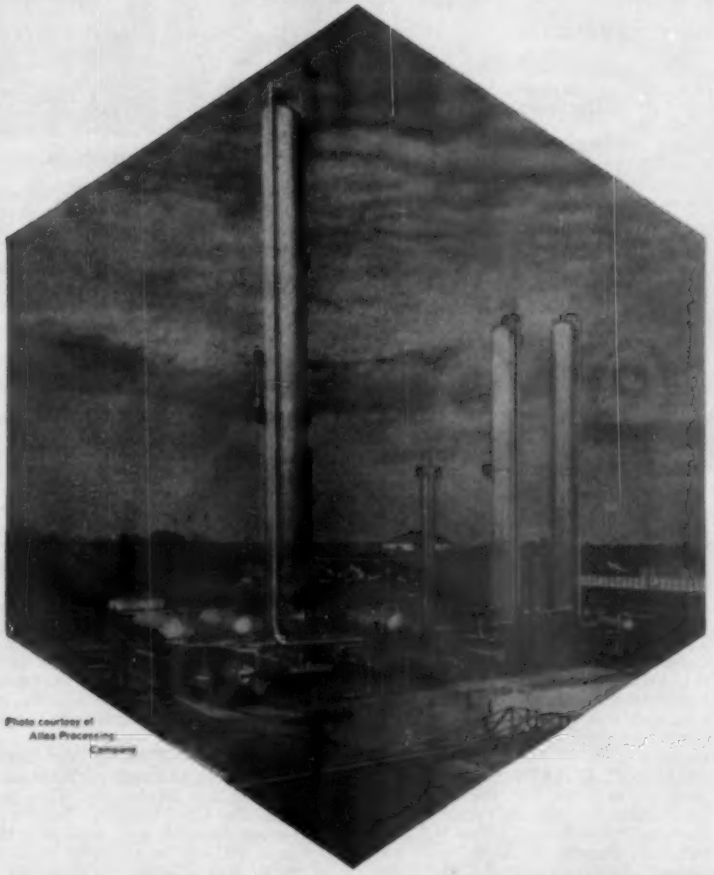


Photo courtesy of Atlas Processing Company

Increasing the aromatic content of motor fuel is the good old-fashioned way to raise its octane number. But aromatics have certain characteristics which limit the concentration you should use in motor fuel. If you want to go further ... produce the *best quality motor fuel* ... your next move is to convert your pentane and hexane fractions to isoparaffins with Penex.

As constituents of fuel, isopentane and isohexane have good sensitivity, complete burning with good ignition, better lead susceptibility and good volatility. Used in a balanced blend with aromatics, they assure production of the *best quality motor fuel now on the market.*

This practical, economical process upgrades your poorest quality blending components, normal pentanes and hexanes ... gives you the isoparaffins you need. A technical bulletin on Penex is yours for the asking. Write for it today.

**UNIVERSAL OIL PRODUCTS COMPANY**

30 Algonquin Road, Des Plaines, Illinois, U. S. A.

WHERE RESEARCH TODAY MEANS PROGRESS TOMORROW

**CLINTON DOW MIMS** moves to Standard Oil Co. of California, Western Operations, Inc., San Francisco, as assistant general manager of the producing department. He was formerly vice-president of production for Standard Oil Co. of Texas, a California Standard subsidiary.

C. D. Mims

E. W. Midlam

**EDWARD W. MIDLAM** has rejoined Cit-Con Oil Corp. as vice-president, general manager, and a director. Cit-Con, which produces lubricating oils and petroleum waxes at its Lake Charles (La.) plant, is jointly owned by Cities Service Co. and Continental Oil Co. Midlam joined Cit-Con in 1950 as a process engineer, and a year later became manager of technical services. He held that position until 1957, when he began his most recent assignment as staff executive of Cities Service Petroleum, Inc., with offices in New York.

**JOHN R. INGRAM** has been appointed manager of Standard-Vacuum Oil Co.'s lubricating and special products supply department, with headquarters in White Plains, N.Y. He succeeds **Frank V. Williams,** who has become refinery manager for Stanvac's refining subsidiary at Durban, South Africa. Ingram joined Stanvac in 1933, after three years with Socony Mobil Oil Co. In 1954 he was assigned as a sales executive in the India division office at Bombay, and three years after that, returned to White Plains as special assistant to the lubricating and special products supply manager.

**CANADIAN HUSKY OIL, LTD.,** has realigned its senior management staff and created an executive committee as part of a plan to integrate its Canadian and United States operations. Members of the new executive committee hold the same positions in Canadian Husky and Husky Oil Co., Cody, Wyo. **Lawrence W. Lee, M. R. McArthur,** and **George S. Buchanan** were named senior vice-presidents. Lee coordinates manufacturing and marketing activities, including oil, steel, and briquetting operations; and McArthur directs oil and gas production and drilling, and is president of Husky's partially owned subsidiary, Rimrock Tidelands, Inc. Buchanan is in charge of foreign operations and special projects. Vice-presidents **Arthur C. Knight** and **T. G. Wise** will work together in marketing Husky products in both countries. Wise is responsible for refining and marketing, and Knight directs development of new markets, and is responsible for public relations and advertising. **W. E. Powell,** vice-president, will direct Husky's land and exploration activities in Canada and the United States. **Maurice E. Smith** is vice-president in charge of law, and **Arnold Larsen** is vice-president of finance. **Jesse D. Winzenried** becomes assistant to the president. In addition to his staff duties, he will direct the company's industrial relations activities. Identical boards for the Canadian and U.S. companies were also elected at a recent directors' meeting in Calgary.

**K. E. ROTEGARD** takes over as manager of Gulf Oil Corp.'s newly created domestic services department in Houston. The department will be responsible for handling all advisory and service elements for domestic operations, including data processing, employee relations, insurance, law, public relations, purchasing, tax, treasury, and Houston headquarters office services. Rotegard has been financial and services coordinator, domestic production, in Houston since 1959.

**HARRY TERRELL** has been elected president of Wacker Oil Co., independent producer in the Gulf Coast area, formerly known as Ammco Oil Co. Terrell has been with Richardson & Bass, Ft. Worth. Wacker has moved its headquarters office from Houston to New Orleans, and its production activities have expanded into Louisiana and Mississippi.

H. Terrell

S. M. Anderson, Jr.

**S. M. ANDERSON, JR.,** is the new manager of King-Stevenson Oil Co.'s southwestern division in Oklahoma City. The division is responsible for exploration activities in Arkansas, Kansas, Lousiana, Oklahoma and Texas. Anderson was formerly associated with Calvert Petroleum Co., the Oklahoma Independent Petroleum Assn., and Vickers Petroleum Co., and was an independent operator in western Kansas.

**DONALD C. O'HARA** was appointed general counsel of the National Petroleum Assn., at its recent annual meeting at Atlantic City, N.J. He succeeds **Fayette B. Dow,** who was named honorary counsel. O'Hara was formerly NPA's assistant general counsel.

**RAYMOND M. LARSEN,** petroleum engineer with the U.S. Geological Survey at Casper, Wyo., was honored by the Society of Petroleum Engineers of AIME for his contributions to society activities, at its Denver meeting this month. His Certificate of Service was given for his work on the annual volume on statistics of oil and gas development production.

**GEORGE F. KUHN,** administrative assistant to **T. B. Kimball,** executive vice-president, operations, of Sinclair Oil Corp., has been elected a director of Sinclair & BP Sales, Inc., jointly owned by Sinclair and British Petroleum Co. Kuhn, who joined the Sinclair organization in 1926 at East Chicago, Ind., moved to New York in 1950 as an administrative assistant in the manufacturing department. In 1956 he was promoted to manager of refinery economics in the manufacturing department, and after that became administrative assistant to Kimball.

G. F. Kuhn

W. D. Harris

**WILLIAM D. HARRIS** succeeds **Frank Graves** as manager of Lion-brand sales for Lion Oil Co., division of Monsanto Chemical Co., at El Dorado, Ark. Graves was recently named manager of private-brand sales. Harris has been associated with a major oil company for the past 12 years, serving in a sales capacity at Independence, Kan., Sedalia, Mo., and Tulsa.

**WOODROW A. MARTIN** is the new assistant director of labor relations for Texaco Inc., with offices in New York. He was formerly assistant superintendent for industrial relations at the company's Port Arthur (Tex.) refinery.

**RAYMOND B. KELLY,** vice-president and a director of Pure Oil Co., moves to Ft. Worth as consultant on field operations. He continues as an officer and director, Kelly, with Pure for 35 years, has served in exploration and production operations in Texas and Southern Illinois, and in the Chicago headquarters.

**JOHN S. BLACK** will succeed **George H. Supple** as manager of West Coast pipelines for Mobil Oil Co., with offices in Los Angeles. Supple retires on Dec. 31, and until that time Black will act as assistant manager. Black was formerly president of South Saskatchewan Pipe Lines, in which Mobil Oil Canada, Ltd., owns a 50% interest. Before he moved to Canada in 1955, Black was district superintendent in Beaumont, Tex., for Magnolia Pipe Line Co., also an affiliate of the Mobil organization.

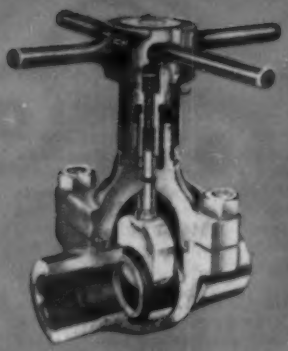


Figure 2128 Resilient Seat Gate Valve. 2", 3", 4", 2000 lb W.P. EValcoat protective Plastic Coating.

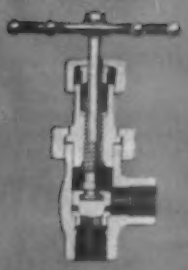


Figure 2000 Forged Steel Angle Valve. ½", ¾", 1", 2000 lbWOG. Not Plastic Coated.

Figure 152J Forged Steel Gage Valve. Size ½", 4000 lb WOG. Not Plastic Coated.

Figure 2666 Throttle Disk Forged Steel Globe Valve. Size 1", 2000 lb WOG. EValcoat Plastic Coating.

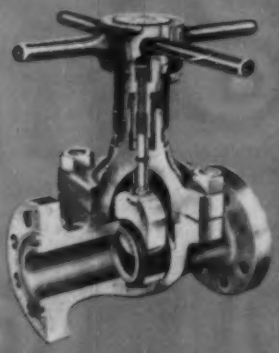


Figure 3118 Resilient Seat Gate Valve. 2", 3", 4", 2160 lb W.P. EValcoat protective Plastic Coating.

Figure 126 Forged Steel Strainer. Size 1", 2000 lb WOG. EValcoat protective Plastic Coating.

Figure 2676 Forged Steel Check Valve. Size 1", 2000 lb WOG. EValcoat protective Plastic Coating.

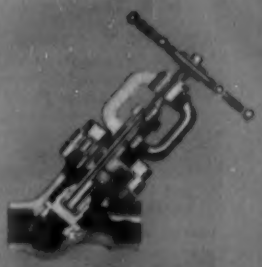


Figure 448 Forged Steel Globe Valve. 1½", 2", 2000 lb WOG. Not Plastic Coated.

# NEW, BROADENED LINE OF ROCKWELL-BUILT EDWARD STEEL WATERFLOOD VALVES

## Available with and without exclusive EValcoat* protective plastic coating

EDWARD STEEL VALVES
another fine product by
ROCKWELL

Now you can get service-proved Edward steel valves for every waterflood service . . . from pump house to well head.

You can get any size you need from ¼" to 4" and any pressure class to 3000 lb W.P. All types, too: globe valves, resilient-seat gate valves, check valves, gage valves and strainers.

For maximum corrosion resistance most Edward waterflood valves are available with exclusive "EValcoat" plastic coating, a premium feature at a modest price. Or you can get similar non-coated valves for those floods where plastic protection is not required.

For more information, see your favorite oilfield supply store, or use the handy coupon.

*EValcoat is a Trade Mark of Edward Valves, Inc. 6016

**Edward Valves, Inc.**
**Subsidiary of Rockwell Manufacturing Company**
**1236 W. 145th St., East Chicago, Indiana**

Please send me your new Waterflood Valves Catalog No. 14-J1.

Name_____

Company_____

Street address_____

City_____ Zone____ State_____

**B. R. DIXON** has been promoted to vice-president, operations, and elected a director of Johnston Testers, Inc. He will continue to be located at the company's headquarters in Houston, where he was formerly operations manager. In his new position, Dixon will coordinate domestic sales and service operations.

B. R. Dixon

A. T. Jones

**AUSTIN T. JONES,** assistant to the sales manager of BJ Service, Inc., subsidiary of Borg-Warner Corp., transfers from Ft. Worth to Wichita, Kan., to represent BJ in that area of expanding petroleum activity. Jones has been with BJ for the past five years; he has held several field and technical positions, ranging from treater to district engineer.


**SEARCHLIGHT SECTION**

(Classified Advertising)

EMPLOYMENT — BUSINESS
EQUIPMENT — USED OR RESALE
OPPORTUNITIES

**DISPLAYED RATE**
EQUIPMENT & BUSINESS OPPORTUNITY advertising $16.75 per inch.
EMPLOYMENT OPPORTUNITIES — $20.00 per inch, subject to Agency Commission.

**UNDISPLAYED RATE**
(Not available for equipment advertising)
$1.80 a line, minimum 3 lines.
POSITIONS WANTED undisplayed rate is one-half of above rate, payable in advance.
Box Numbers—Count as one line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.

**BUSINESS OPPORTUNITY**

**Capital wanted in oilfield salvage business.** Investment should earn over 30% on three sales. Appraisals by man of 20 years experience with major supply company. Full details—Apt. C. Zarah Hotel, Great Bend, Kansas.

**Financial—Investment Banking Houses and** Underwriters reached. Confidential. You can send the details of your proposition direct or thru your attorney to Consultant 817—51st Street, Brooklyn, N.Y.

**IF**
*there is anything you want*
that other readers can supply
**OR**
*. . . something you don't want—*
that other readers can use—
*Advertise it in the*
*SEARCHLIGHT SECTION*


**MALCOLM THOMAS** assumes additional responsibilities as production manager for Varel Mfg. Co., Dallas oilfield specialty equipment manufacturing company. He continues as Varel's purchasing agent, a position he has held since 1958.

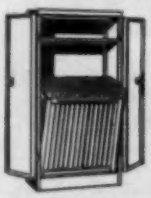
**CHARLES C. SNIDER** has been elected vice-president of Consolidated Electrodynamics Corp., Pasadena, Calif., subsidiary of Bell & Howell Co. Snider will direct CEC's international operations, provide liaison between the company's product divisions and the international requirements of the parent company, and contribute to product and policy planning for Bell & Howell's total international activities. He will report to **Everett F. Wagner,** vice-president of Bell & Howell's international division. For the past four years, Snider was director of sales of CEC's data processing divisions.

C. C. Snider

A. Valchuk

**ALEXANDER VALCHUK** is the new managing director of the Netherlands manufacturing plant of Byron Jackson, a division of Borg-Warner Corp. The Netherlands operation, called Byron Jackson, N.V., manufactures oil tools for the export market. Valchuk succeeds **Earl M. Rees,** who has directed manufacturing operations since the plant was opened in 1959, and before that supervised construction of the facility. Valchuk, who has been with the BJ organization since 1947, was most recently northeast regional manager for Byron Jackson Pumps, Inc.

**EUGENE MORIARTY** has been elected assistant vice-president, new projects, for Scientific Design Co., New York. He will serve in the sales department, and will be involved in enlarging the scope of the company's activities. Moriarty was formerly manager of new chemical projects for Vitro Engineering Co., and has also served as senior sales engineer and assistant western manager for Lummus Co.


**MAP**  **FILE**

**CONFIDENTIAL — DOORS LOCK!**
The sturdy MT4 steel cabinet map file has 112 tilting tubes. Easy to file and find maps, tracings and blue prints to 60" lengths. Keeps valuable information dust proof and confidential. Popular everywhere in both field and home offices. Write for illustrated information.
**SHIPPED IMMEDIATELY FROM STOCK**
Patent No. 1610368. Other Patents Pending.
**SCOTT-RICE CO., 610 S. Main, Tulsa 19, Okla.**


**WILLIAM C. BAILEY** moves up to branch manager of Sauder Tank Co.'s newly established Enid (Okla.) office. He was formerly Sauder's sales representative at Pratt, Kan. He will service the Enid area, which includes Garfield, Kingfisher, Alfalfa, Grant, Noble, Logan, and other surrounding counties.

**J. A. TUCKER** has been appointed chief engineer, lease automatic custody transfer and processing equipment, for Jones & Laughlin Supply Division, at Tulsa. Tucker will administer the sale of Major Engineering Co.'s meter automatic custody transfer units as well as tanks and related lease processing equipment. J & L recently became distributor for Major Engineering. Tucker, who joined J & L as a salesman in 1947, was most recently chief sales engineer, projects.

J. A. Tucker

J. W. Northcutt

**J. W. NORTHCUTT** has been named assistant vice-president of Rockwell Mfg. Co. and manager of its petroleum and industrial meter division, with offices in Pittsburgh. Northcutt, who joined Rockwell in 1937, has been assistant vice-president in Rockwell's municipal and utility division since 1956.

**JOHN W. JENNINGS,** formerly application engineer for the Houston district of Clark Bros. Co., one of the Dresser Industries, has been promoted to sales representative, small engines, for the same district. **John L. Spencer** is the new application engineer at Houston, reporting to **J. Y. Allen,** district manager. Spencer joined Clark as an associate engineer in 1959. **James O. Campbell** transfers to Clark's Los Angeles district office as application engineer. He was formerly application engineer in the Turbo marketing department at the company's headquarters in Olean, N.Y.

**BRADFORD MOTOR WORKS, INC.,** Bradford, Pa., has purchased the capital stock of Chas. N. Hough Co., Franklin, Pa. Both companies manufacture and distribute oilfield pumping equipment. Plant facilities of Hough, now managed by **Charles**

# WHERE DO YOU STAND ON COMPUTER CONTROL— LEADING OR LAGGING?

Far-sighted leaders in industry are realizing the benefits made possible by applying computer control systems to their processes.

Working with these leaders, General Electric has already pioneered the application of twenty on-line GE-312 computer systems now being implemented in these basic areas —STEEL, ELECTRIC UTILITIES, CHEMICAL, CEMENT, and PRODUCTION CONTROL for various manufacturing applications.

The GE-312 Computer Control System embodies adaptability and flexibility to meet many types of applications in varying size plants. For example, compare its expansible memory—capacity up to 52,000 words. Compare its flexible input/output—capable of scanning up to 1500 instrument inputs. These are maximum capabilities, expansible from a minimum system. You buy a system tailored to your exact requirements.

Add to this versatile equipment the computer systems engineering ability demonstrated by General Electric in implementing these twenty GE-312 system applications.

Add also the long history of General Electric overall systems know-how—its broad background in the equipment, processes and materials to which you apply computer control.

Tomorrow's profits will come from today's combination of vision, equipment, and know-how. *Where do you stand?*

---

There are General Electric Sales and Application engineers in over one hundred offices throughout the nation to serve you. *Phone* the nearest General Electric Apparatus Sales Office, or *wire* General Electric Computer Department, 13447 North Black Canyon Highway, Phoenix, Arizona.

PROCESS CONTROL
AUTOMATED BY GENERAL ELECTRIC

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

CPS-55 6-60

*General Electric—a pioneer in computer systems for all phases of business, industrial, scientific, engineering, and financial endeavor.*

**N. Hough, Jr.**, will be transferred to Bradford. There will be no change in sales personnel of either company at present, and Hough's Tulsa warehouse will be maintained.

**MEREDITH ROBERTS** is the new export sales manager, and **Willi Stahl** assistant export sales manager, for Parkersburg Rig & Reel Co.'s export division, which was recently moved from New York to company headquarters in Houston. Roberts has been manager of Parkersburg's South American sales, with offices in Caracas and Maracaibo, Venezuela. Stahl has been a Parkersburg development engineer on glycol dehydrators, steam generators, and salt bath heaters for the past four years.

**DONALD R. PIATT** has joined Veeder-Root, Inc., manufacturer of computers and counting instruments, as vice-president of engineering and research, with offices in Hartford, Conn. He was formerly manager of engineering for the time equipment division of International Business Machines Corp. He has served as a consultant on electromechanical devices for the Dept. of Defense since 1956. Piatt has also been director of engineering for Universal Controls, Inc., and vice-president of research and engineering for Underwood Corp.

**DONALD M. BROCK** has resigned as sales manager of Garrett Oil Tools, division of U.S. Industries, Inc., Longview, Tex., to form his own organization, Brock Oil Tools, Inc. The new company will offer a complete line of gas lift equipment. Its main office will be in Houston, and district sales points will be in Lafayette and New Orleans, La., and Victoria and Odessa, Tex.

**MINNEAPOLIS-HONEYWELL REGULATOR CO.** has changed the name of its Datamatic division to the Electronic Data Processing division. It was changed to make the division's name clearly express its product line and to identify these products more closely with Honeywell. The Datamatic name was chosen in 1955 when Honeywell and Raytheon Corp. jointly formed the Datamatic Corp. to manufacture data processing systems. Honeywell bought out Raytheon's interest, and has operated the company as the Datamatic division for the past three years.

**WALTER RUDER** has been appointed Alberta district manager for Mountain Iron & Supply Co., with headquarters at the company's new branch sales office at Edmonton, Alta. Mountain Iron has two other Canadian offices, at Calgary, Alta., and Estevan, Sask. Ruder was formerly district manager at Mountain Iron's store in Columbus, N.D.

A. Perez

I. L. Roberts

C. A. Rosenthal

**ADAM PEREZ, I. L. ROBERTS,** and **C. A. ROSENTHAL** have been assigned to new division manager positions with Schlumberger Well Surveying Co. Perez, formerly sales manager for the Louisiana Gulf Coast division, at Lafayette, succeeds Rosenthal as manager of the Southern Rocky Mountain division, at Denver. Rosenthal becomes Texas Gulf Coast division manager, at Houston, succeeding Roberts, who transfers to Lafayette as manager of the Louisiana Gulf Coast division. Roberts replaces **W. J. Bowen**, now in the overseas organization.

# ADVERTISERS IN THIS ISSUE


| | |
|---|---|
| A.C.F. Industries Inc., W-K-M Div. | 6-7 |
| Aluminum Co. of America | 65 |
| Atlantic Refining Co. | 56 |
| Avondale Shipyards, Inc. | 70-72 |
| Baroid Div., Nat'l Lead Co. | 62-63 |
| Beaird Co., Inc., J. B. | 92-93 |
| Beckman Instruments, Inc. | 22 |
| Bethlehem Steel Co., Supply Div. | 8-9 |
| Cameron Iron Works, Inc. | 16 |
| Chemical Construction Corp. | 54-55 |
| Chiksan Co. | 85 |
| Continental Emsco Co., Div. of Youngstown Sheet & Tube Co. | 31 |
| Cooper-Bessemer Corp., The | 102-103 |
| DeLaval Steam Turbine Co. | 52 |
| Dowell | Cover 3 |
| Eastman Chem. Prods., Inc. | 82-83 |
| Edward Valves, Inc. | 107 |
| Ethyl Corp. | 1 |
| First City Nat'l Bank in Houston | 2 |
| General Electric Co., Computer Dept. | 109 |
| Geophysical Service Inc. | 40 |
| Grove Valve & Regulator Co. | 74-75 |
| Halliburton Co. | 35 |
| Harbert Construction Co. | 80 |
| Harbison-Fischer Mfg. Co. | 53 |
| Houdry Process Corp. | 76 |
| Houston Oil Field Material Co. | 46-47 |
| Hudson Eng. Corp. | 61 |
| Humble Oil & Refining Co. | 64 |
| Jones & Laughlin Supply Div. | 58-59 |
| Kellogg Co., H. W. | Cover 4 |
| Latex Constuction Co. | 91 |
| Lone Star Steel Co. | 10-11 |
| Mack Trucks Inc. | 51 |
| Martin Mfgr., John N. | 60 |
| McCullough Tool Co. | 19 |
| Mid-Continent Supply Co. | 20-21 |
| Mission Mfg. Co. | 36 |
| Nalco Chemical Co. | 99 |
| National Tube Div., U.S. Steel Corp. | 88-89 |
| Nordstrom Valve Div., Rockwell Mfg. Co. | 66-67 |
| Oil Well Supply Div., U.S. Steel Corp. | 90 |
| Parkersburg Rig & Reel Co. | 77 |
| Petreco Div., Petrolite Corp. | 13 |
| Petroleum Electric Power Assn. | 94 |
| Petroleum Week | 81 |
| Plastic Applicators, Inc. | 49 |
| Polyken Prods., Div. Kendall Corp. | 12 |
| Price Co., H. C. | 27 |
| Procon, Inc. | 78 |
| Rector Well Equipment Co., Inc. | 33 |
| Republic Nat'l Bank of Dallas | 32 |
| Reynolds Metals Co. | 38-39 |
| Ridge Tool Co., The | 41 |
| Schlumberger Well Surveying Corp. | 45 |
| Scott-Rice Co. | 108 |
| Smith Corp., A. O. Smith-Erie Div. | 14-15 |
| Southwest Industries, Inc. | Cover 2 |
| Southwestern Pipe Inc. | 101 |
| Southwestern Industrial Electronics | 97 |
| Standard Oil Co. (Indiana) | 4 |
| Standard Oil Co. (New Jersey) | 68 |
| Sun Oil Co. | 48 |
| Universal Oil Prods. Co. | 5, 105 |
| Vogt Machine Co., Henry | 29 |
| W-K-M Div., A.C.F. Industries, Inc. | 6-7 |
| Worthington Corporation | 42-43 |


**Classified Advertising**
**F. J. Eberle, Business Mgr.**


| | |
|---|---|
| Business Opportunities | 108 |


## PETROLEUM WEEK REPRESENTATIVES

Atlanta 9 — R. H. Powell
1375 Peachtree St., N.E.
Trinity 5-0523

Boston 12 — David G. Sawyer
Copley Square
Congress 2-1160

Chicago 11 — Edward A. Callahan Jr.
520 N. Michigan Avenue
Mohawk 4-5800

Cleveland 15 — Marcus A. Loy, Jr.
1164 Illuminating Bldg.
55 Public Square
Superior 1-7000

Dallas 1 — James R. Pierce
2100 Vaughan Bldg.
1712 Commerce Street
Riverside 7-9721

Denver 2 — J. W. Patten
Tower Bldg., 1700 Broadway
Alpine 5-2981

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter C. Carberry
1125 W. Sixth St.
Huntley 2-5450

New York 36 — David G. Sawyer
500 Fifth Ave.
Oxford 5-5959

Philadelphia 3 — H. Sherman Davis
6 Penn Center Plaza
Locust 8-4330

Pittsburgh 22 — Marcus A. Loy, Jr.
Room 1111, Oliver Bldg.
Express 1-1314

Portland 4 — Scott Hubbard
Room 445, Pacific Bldg.

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

Tulsa 3 — J. A. Hartley
909 Enterprise Bldg.
522 South Boston
Luther 7-5544

England, London E. C. 4 — E. E. Schirmer
McGraw-Hill Co., Ltd.
95 Farringdon St.

Germany, Frankfurt/Main — S. Kimes
85 Westendstrasse

Switzerland, Geneva — M. R. Zeynel
2 Place du Port

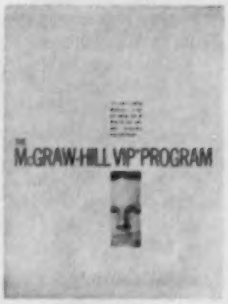
**If a man is making decisions ...if you are paying him to think for your company...he is a**

# VIP*

*VERY IMPORTANT PERSON

**He's a Very Important Person to You!** The decisions he makes, his ability to think constructively about your business — his ideas, his enthusiasm — are all vital to his success, and yours. Multiply him by all the thinking men on whom you depend for today's operations and your business future. Now, you can directly help each of these men be better informed about his job, his company's problems, his industry. The cumulative effect can only mean immediate and increasing dividends to yourself.

**He's a Very Important Person to Us!** He is the identical man for whom McGraw-Hill business and industrial publications are edited. Our business is to keep him updated on his business — your business. Ours is a unique service of specialized communications. The McGraw-Hill VIP Program capitalizes on these information facilities, integrates them in a way to provide your decision-making managers, engineers and key personnel with complete, timely business and technical "intelligence" available nowhere else.




**Be sure you get this new booklet!** Now, the business reading your VIP's do can actually be "engineered" to their specific job needs, and your company's best interests. You'll find it detailed in new booklet . . .

**THE McGRAW-HILL VIP PROGRAM**
330 West 42d Street, New York 36, N. Y.

# Suppliers Urge Depletion Support

IN THEIR OWN BEST INTEREST, manufacturers and suppliers of oil country goods and supplies should assume an active role in support of the present depletion percentage for crude and gas. That is the advice the Petroleum Equipment Suppliers Assn. is circulating to its members.

PESA uses the following arguments to support its position:

The U.S. Treasury Dept. has estimated that a cut in the depletion rate from the present 27½% to 15% would net the government approximately $400-million annually in additional revenue from the petroleum industry.

UNDER MORE NORMAL CIRCUMSTANCES, the industry might anticipate recovering at least part of this sum through higher prices for crude and products. With the existing oversupply, however, it is unlikely that price increases are possible, much less probable.

Thus, the $400-million would come out of operating budgets. Industry authorities figure that—at an average cost of $50,000 per hole drilled—this would mean at least 8,000 fewer tests would be drilled by the industry each year.

In the first half of this year, wells completed averaged 4,332 ft. in depth. On that basis, 8,000 fewer tests equals 34.7-million fewer feet of hole to be drilled each year, and a substantial reduction in demand for casing, tubing, drill pipe, as well as mud, cement, bits, and other items.

THE PETROLEUM INDUSTRY'S OWN RECESSION of the past two or three years has already had serious repercussions on drilling, and thus on sales of oilfield equipment and supplies. As one example, steel production is running at only 60% of capacity this year, and steel executives have frequently cited reduced demand for oilfield tubular goods as one major factor in the cutback.

It is estimated that only 45,551 holes will be drilled this year—the fewest since 1951. A cut in the depletion percentage would further compound the slowdown.

Thus, PESA says, those who make and sell oilfield equipment and supplies owe it to themselves to work actively in support of the present percentage depletion rate.

# ABRASIJET AND FRACTURING BY DOWELL BOOST PROFITS FOR MANY OPERATORS

More and more operators are reporting exceptionally good results from fracturing treatments preceded by Abrasijet*—Dowell's abrasive jetting service. With Abrasijet, notches can be cut to initiate fractures in the direction and plane desired. For example, it can be used to initiate horizontal fractures, reducing the danger of opening a vertical fracture into water or gas. In addition, this combination treatment often costs less than conventional perforating and fracturing.

*In Kern County, California,* a $15,000 Dowell treatment resulted in an 80 bopd flowing well and saved $20,000 in pumping equipment costs. The offset well is a 25 bopd pumper.

*In Crane County, West Texas,* an operator boosted potential from 7 to 171 bopd with Abrasijet and fracturing.

*In Wyoming,* an $1800 treatment with Abrasijet and fracturing made a 91 bopd producer out of a well that had been abandoned for two years.

*In Illinois,* an operator in Lawrence County, an area where formation water is a problem, realized a six-week treatment payout on a Tar Springs well. The combination treatment, Abrasijet and fracturing, cost only $1300.

Ask your Dowell representative to show you how this combination of Abrasijet and fracturing can help improve your production and hold stimulation costs at a minimum. For prompt service or detailed information, call the nearest Dowell office or station. Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina and Germany. Dowell, Tulsa 1, Oklahoma.

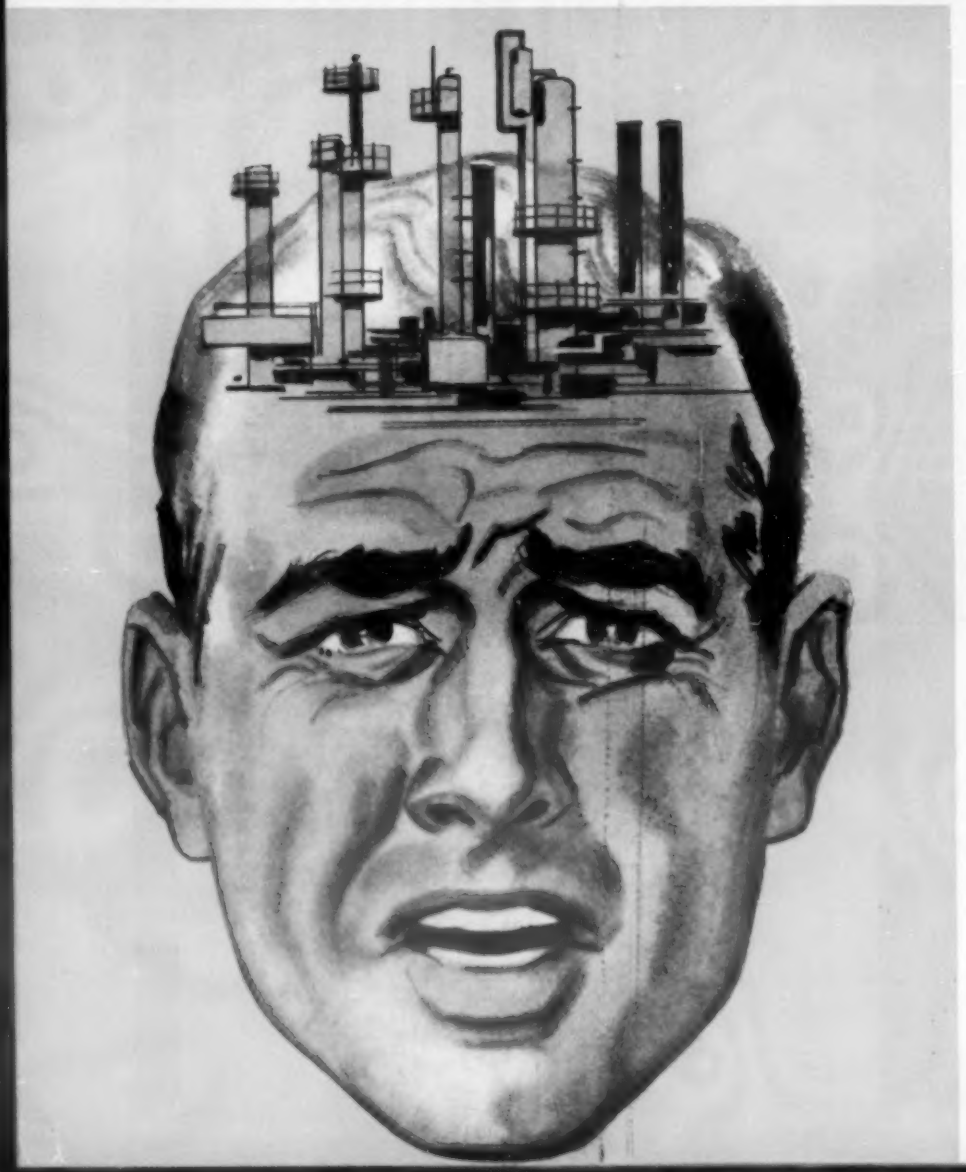
*DOWELL TRADEMARK

*Services for the oil industry*

DOWELL

DIVISION OF THE DOW CHEMICAL COMPANY

# Kellogg Cures Sulfur Headaches with Low-Cost Hydrotreaters



## KELLOGG-DESIGNED UNITS REDUCE CORROSION, INCREASE CATALYST LIFE AND SELECTIVITY, IMPROVE PRODUCT QUALITY WITH LESS TEL

With less low sulfur crude available today, and product specifications increasingly difficult to meet, a Kellogg hydrotreater is the refiner's answer to the many refining, storage and marketing problems presented by high sulfur-content feedstocks.

Working closely with the refiner's engineers, as it has done with those of leading oil companies throughout the United States—as well as in Canada, South America, Europe, Asia and Australia—Kellogg can design a unit that will remove harmful sulfur compounds to almost any degree desired, and also permit decrease of TEL.

Optimum investment and operating costs are also assured through designs that utilize selective pressures, reduce the use of costly alloys such as 18-8, and lower the consumption of high pressure hydrogen.

### A Record in Desulfurization

To date, as shown at right, Kellogg has engineered and/or erected 17 reformer feed hydrotreaters—with a total capacity of over 161,000 BPSD, and 13 distillate hydrotreaters—with a total capacity of over 164,000 BPSD.

To acquaint you further with desulfurization by hydrotreating, Kellogg will gladly send you copies of a recent paper written by two of its engineers and reprinted from "Petro/Chem Engineer."

**REFORMER FEED DESULFURIZERS**

| | | |
|---|---|---|
| Heath, Ohio | 3,000 | BPSD |
| Houston, Texas | 24,000 | BPSD |
| Bakersfield, Cal. | 4,000 | BPSD |
| Kent, England | 10,000 | BPSD |
| Grand Prairie, Alberta | 875 | BPSD |
| Antwerp, Belgium | 2,500 | BPSD |
| Toledo, Ohio | 22,000 | BPSD |
| Ponca City, Okla. | 16,000 | BPSD |
| Dunkerque, France | 10,000 | BPSD |
| Lemont, Ill. | 18,000 | BPSD |
| Vancouver, B.C. | 7,200 | BPSD |
| Kwinana, Australia | 10,000 | BPSD |
| Montevideo, Uruguay | 3,000 | BPSD* |
| Concon, Chile | 6,000 | BPSD |
| Dinslaken, Germany | 10,000 | BPSD* |
| Antwerp, Belgium | 10,000 | BPSD |
| Turkey | 4,600 | BPSD* |

**DISTILLATE DESULFURIZERS**

| | | |
|---|---|---|
| Kwinana, Australia | 5,600 | BPSD |
| Port Arthur, Texas (2) | 45,000 | BPSD |
| Philadelphia, Pa. (2) | 45,000 | BPSD |
| Martigues, France | 12,500 | BPSD |
| Kent, England (2) | 20,000 | BPSD |
| Antwerp, Belgium | 10,000 | BPSD |
| Clarkson, Ont. | 8,000 | BPSD |
| Vancouver, B.C. | 4,000 | BPSD |
| Dinslaken, Germany | 10,000 | BPSD* |
| Turkey | 4,500 | BPSD* |

*Future

**THE M. W. KELLOGG COMPANY**
711 Third Ave., New York
*A subsidiary of Pullman Incorporated*
Offices of other Kellogg companies are in Toronto, London, Paris, Rio de Janeiro, Caracas, Buenos Aires